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THE  
LONDON LANCET.

A JOURNAL OF

BRITISH AND FOREIGN MEDICAL,  
SURGICAL AND CHEMICAL SCIENCE,  
CRITICISM, LITERATURE AND NEWS.

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FOR THE YEAR 1876.

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EDITED BY

JAMES G. WAKLEY, M.D., M.R.C.S.

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New York :

1876.



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# THE LANCET.

A Journal of British and Foreign Medicine, Physiology, Surgery,  
Chemistry, Criticism, Literature, and News.

JAMES G. WAKLEY, M.D., M.R.C.S., EDITOR.

PUBLISHED MONTHLY.

No. 1.

NEW YORK, JANUARY, 1876.

## A Clinical Lecture

ON

### THE PULSE: ITS DIAGNOSTIC, PROGNOSTIC, AND THERA- PEUTIC INDICATIONS.

*Being Lecture V. delivered at St. Mary's  
Hospital in the Summer Session of 1875,*

By W. H. BROADBENT, M.D., F.R.C.P.,  
Physician to the Hospital.

GENTLEMEN,—I told you in my last lecture that there were three factors in the production of the pulse—namely, the heart, the small arteries by means of the muscular coats, and the large arteries by their elasticity. We considered chiefly the heart, on which, as I pointed out, depend the frequency, force, and rhythm of the pulse. I may here add that the indications afforded by the action of the heart are of importance chiefly in *acute* disease. But the action of the heart, and therefore the rate, rhythm, and force of the pulse is greatly influenced by the small arteries; on them, however, more especially depends the character of the pulse, which may be said to be determined by the peripheral resistance. I mentioned only one element in this peripheral resistance—the contraction or relaxation of the muscular walls of the minute arteries; but there is another element which must not be lost sight of, though the part which it plays is not definitely known—the degree of facility with which the blood traverses the capillary network.

On considering the results of relaxation and contraction of the arterioles on the pulse, we found that the following variations in character must necessarily accompany these opposite conditions. When we feel the pulse, if the arteries are relaxed the diameter of the vessel is increased and the pulse feels *large, quick* or *short*, and *soft*, the tension being low. With contracted arteries the converse obtains in each particular. The diameter

is diminished and the pulse feels *small*; the blood passes through the vessels with greater difficulty and more slowly, and the pulse becomes *long*; the tension is high and gives it the character of *hardness*.

With regard to the effect produced on the pulse by the aorta and large arteries, I stated in my last lecture that they equalised the flow of the blood; they have, however, besides this, other and highly important effects, which are best shown by the sphygmograph, and to which I will now briefly call your attention.

The sphygmograph is invaluable as an exact means of observation, and has been a great means of educating us how to feel and properly appreciate the pulse—has, in fact, as I said, rediscovered for us the indications furnished by the pulse. It will never come into use in general practice, for it demands not only time and care at each application, but also a careful preliminary training. It is an instrument of precision and requires a skilled workman. The value of its revelations depends entirely on the intelligence which is brought to bear on its employment, and if carelessly used it can only lead to error. A good rifle is more sure to hit if the aim be good, but it is more sure to miss if the aim be bad. Completely different tracings may be obtained from the same pulse by variations in the pressure employed. The employment of the exact pressure which will best bring out the features of the pulse is a matter of skill, and, the amount of pressure required being an important item of knowledge, great uncertainty arises here. Moreover, not only is it in the operator that sources of error may arise; the instrument itself, by variations in its construction, may invalidate the result for all purposes of comparison. To interpret a tracing satisfactorily certain details respecting the sphygmograph producing it must be known, and much experience is required to render the tracings by different instruments comparable. Not only may there be inaccuracy in the determination of the force of the spring, but the size of the pad applied to the artery will make a difference in the amount of pressure required. The smaller the pad, the weaker must be the spring; and if a knife-edge be applied in place of a pad the results will be more delicate, and the pressure required to obtain a perfect tracing, or to compress the artery completely, will be still less.

I have some tracings here\* (kindly furnished me by my friend and colleague, Dr. Mahomed, of whose skill and experience I am glad to avail myself) which I now pass round for your inspection; they afford examples of the normal form of pulse, of pulses of relaxed arteries with low tension, and of contracted arteries with high tension. In the normal pulse the first thing you notice is the line of ascent; this is sometimes sloping a little backwards, it terminates in a sharp apex, and then commences the line of descent. This portion of the pulse-trace has been called the *percussion* element. Sometimes, as in high tension, the line of descent is arrested immediately after its commencement, and the lever is kept up for a short period, or even again rises slightly. This shows that the artery remains full, the stream continuing. This is called the *tidal* wave. Lastly, you see, during the subsidence of the tidal wave, another elevation of the lever, which is especially well marked in pulses of low tension; this is caused by the *dicrotic* wave, and is due to the elastic recoil of the aorta.

The percussion element is somewhat exaggerated in these traces, from the fact that Dr. Mahomed has no spring over the writing lever; but it indicates the suddenness of the contraction, and as a means of recording this it is very valuable. The trace does not, however, exactly represent the movements of the artery, for when the percussion element is excessive, the writing lever is tossed up by the suddenness of the arterial expansion, and actually leaves the short intermediate lever which rests upon and follows exactly the movements of the spring which presses upon the pulse. The pulse has been described as consisting of three waves—the percussion, tidal, and dicrotic waves. The percussion and tidal are not, however, two waves, but two elements of the same wave. The distinction between these elements must be preserved, as each gives a character to the pulse; but the term “wave” is not applicable to the percussion element. This compound wave is entirely produced by the cardiac contraction, and is the chief wave of the pulse; it is that which in an ordinary way produces pulsation in the arteries, and it is only this portion of the pulse that we can usually feel. The cardiac systole produces pressure in all parts of the arterial system; this is not necessarily an onward movement of the blood, for if an artery be tied or compressed there is no onward movement at the point of obstruction, but there is still pulsation. There is, of course, onward motion of the blood in the artery when we feel the pulse; what we feel, however, and what the sphygmograph records, is not movement, but *increased pressure*.

But the entire force of the systole does not take effect in onward movement of the blood; part of it is expended in distending the aorta; and when systole ends the elastic walls of this vessel contract, and by their recoil produce another wave or increase of pressure in the artery—namely, that called the dicrotic pulse wave.

Dicrotism is a phenomenon of arterial relaxation and low tension. Under these circumstances the blood is passing freely and rapidly through the arteries; the heart, meeting with little resistance, contracts rapidly and suddenly; the aorta, like a

spring in a position of rest, is exerting very little pressure on its contents, and yields readily to the sudden distending force, and the rebound, which itself meets with less resistance, is consequently greater. At the wrist what occurs is as follows: the artery, being relaxed, is completely flattened by the spring of the sphygmograph; then by the contraction of the heart it is suddenly filled, and as it is large and relaxed the movement is great, the lever is tossed up suddenly and then falls; in its fall it receives a slight momentary check by the distension caused by the tidal wave not passing off so suddenly as the percussion effect; and then comes the rebound of the aorta, producing the dicrotic wave at the wrist.

Dicrotism sufficiently marked to be of any importance can almost always be appreciated by the touch. For this purpose the three fingers must rest on the vessel in the lightest possible manner, and, attention being given, the dicrotic beat is felt like an echo of the principal wave. Dicrotism can be thus distinguished in most cases of severe pyrexia, in the early stage of typhus, through a great part of enteric fever, and very frequently after fatigue, bodily or mental. Hyperdicrotism is said to be present when the dicrotic wave appears in the upstroke of the trace: the dicrotic wave is overtaken, so to speak, by the percussion of the next pulsation, the fall of the lever being intercepted before it has reached its lowest point. It is simply a phenomenon of excessive frequency of pulse, with relaxation of arterioles. When with extreme frequency there is extreme weakness of the heart's action, the trace becomes *monocrotous* and the pulse fluttering—a condition of fatal prognostic significance. Conversely, if the tension be high, the systole is prolonged because of the resistance in the aorta; the aorta, already tense, cannot yield much, it cannot, therefore, rebound. At the wrist the artery is small, and is not easily flattened. The percussion wave is consequently not so high; the tidal wave, on the other hand, is more sustained, and there is little or no dicrotism on account of the constant distension of the aorta.

Another effect of the elasticity of the aorta is the delay in the transmission of the primary wave of pressure to the wrist. If a system of rigid tubes be taken to represent the arteries, with fenestræ covered by membrane introduced into the system of tubing, one near the heart, the other near the termination of the tubing, and two sphygmographic levers be placed over these membrane-covered openings, the two levers will be seen to rise simultaneously at each contraction; whereas, if the same observation be made with elastic tubing, a considerable interval will elapse between the movements of the two levers: the greater the distance they are apart, the longer will be the interval between their respective movements. This experiment explains the cause of the delay in the pulse at the wrist, which, as you know, is not perfectly synchronous with that in the carotids.

The effect of loss of elasticity in the aorta is seen in the senile pulse, which is characterised by a long tidal wave and a diminution in dicrotism; but, although the pulse is long, it is not hard, but is readily compressed. This character distinguishes it from the pulse of high tension.

Relaxation of the arterioles is induced physiologically by external warmth, exercise, fatigue, &c.; pathologically, by pyrexia &c.; experi-

\* It is not necessary to reproduce them, as the characters of the sphygmographic tracing are well known.

mentally, by various agents—nitrite of amyl, alcohol, Calabar bean, &c.;—contraction, by cold, renal disease, gout, lead-poisoning, digitalis, &c. But this is not the place for the discussion of such causes. I must, however, give the characters of the pulse resulting from a combination of different modes of action of the heart and different conditions of the minute arteries, enumerating the principal states of system in which each form of pulse is met with. I exclude here heart disease, as the pulse of the different valvular and other diseases of the heart will form a separate study on some future occasion.

The action of the heart being frequent and powerful, and the minute arteries being relaxed, the pulse will of course be *frequent* and *strong*, but *large*, *soft*, *short*, and *dicrotus*. When well marked this is the full and bounding pulse of medical writers, but the degree varies greatly. The pulse will have these characters during and just after exercise, especially when there is perspiration; in most pyrexias; in the early stage of most fevers and of acute rheumatism; in pneumonia.

If the heart is weak, but beating rapidly, while the arteries are relaxed, the pulse will be *frequent*, *weak*, *soft* and *short*, *dicrotus*, or perhaps *hyperdicrotus*, or, in an extreme case, *fluttering* and scarcely perceptible. You will observe that I do not say large, for a certain amount of *vis a tergo* is required for this. The pulse described is found in states of debility, more especially when febrile; in the later stages of fevers, in the typhoid state so-called; it is the usual pulse of the moribund.

When with frequent and forcible action of the heart the arteries are contracted, we have the *frequent*, *small*, *incompressible*, *long* pulse. It is met with during rigors, in the early period of acute gout, in acute renal dropsy, in many cases of scarlatina (constituting a difference between scarlet fever and most other fevers), in peritonitis and enteritis, in pleurisy also, and in meningitis.

When the heart's action is weak and the arteries contracted, the pulse becomes exceedingly small, and is often spoken of as "wiry" or "thready," or the former epithet is employed when with a very small artery there is some strength. This pulse is present in its most pronounced form in general peritonitis with collapse, but I have found it in the last stage of phthisis, and in pulmonary gangrene.

It is not my intention, however, to discuss the state of the pulse in acute disease; I wish rather to dwell in greater detail on the state of the arteries in the absence of acute disease; for the study of these conditions has afforded me some of the most valuable knowledge acquired in the course of years of observation and experience; more especially is this true of the recognition of the condition of tension and the causes of its variation.

From what I have previously said you will understand the signs by which we recognise a pulse of high tension. I will, however, once more briefly recapitulate them. But first let me describe the normal pulse. It is of course of average frequency, regular as to time and equable as to strength, and it will be compressible by moderate force, not shooting suddenly under the fingers nor lingering long on the touch. The artery ought not to be easily distinguishable in the intervals of pulsation; it should present no irregularities when the skin is rubbed along its course;

and especially it should not roll under the fingers like a solid cord, or be traceable far up the forearm. The pulsations ought not to be visible, or at any rate not conspicuous. When there is high tension, the artery, usually rather small, but sometimes large, is hard and cord-like; it can be rolled under the finger, and is easily traced in its course up the forearm, where it feels like another tendon lying amidst those in front of the wrist. It reminds one, as I have often said when pointing out these features in the wards, of the *vas deferens*.

When the fingers are first lightly placed upon the vessel, the pulsation detected is inconsiderable, and such a pulse on superficial examination is often set down as weak, but let pressure be applied with a view to its extinction, and it is found to be compressible only on the employment of great force. The apparently weak and really slight pulsatile movement is due to the fact that the artery remains full during the diastole of the heart, and is not flattened by the degree of pressure ordinarily applied; not being flattened, the change of shape produced by the increased pressure of the systole is necessarily inconsiderable. The remaining feature of high arterial tension is that, in consequence of the resistance which has to be overcome by the heart, its contraction is prolonged. The expansion of the artery, therefore, is prolonged, and does not quickly leave the finger, making the pulse long. Briefly, then, the pulse is *small*, *long*, and *hard*. And this is the general character of the high-tension pulse met with, but there are important exceptions and qualifications which must be mentioned, though they cannot be fully considered here. For instance, the artery is sometimes large, very large; the pulse must then be called large, hard, and long, but the pulsation is not large and free for the reason given. Again, when the action of the heart is weak the pulse may appear to be short.

The condition of tension is often associated with tough and thickened arteries, especially in kidney disease, and is often mistaken for mere arterial degeneration; but it frequently occurs as a temporary condition in perfectly normal vessels. The conditions giving rise to high tension may be classified and enumerated as follows:—

1. Degeneration of vessels. Of this there are two kinds. In one the artery is usually large, but sometimes small when associated with a weak heart, and as the finger is run along it, it is found to be bulging at different points, and feels thickened. In the other form the vessel is calcareous, and feels like a string of beads; in this form the artery is not necessarily large. I do not think one is simply an advanced stage of the other.

2. Kidney disease; pregnancy.

3. Gout; suppressed gout, or retained nitrogenised waste; lead-poisoning.

4. Affections of the nervous system.

Besides these, there are various unclassified cases, in which I cannot assign a definite reason for the existence of high tension.

1. *Degeneration of the vessels*.—This frequently results from renal and gouty disease, and it is difficult to draw the line between the tension of these conditions and degeneration.

Arterial tension is produced by obstruction in the capillaries and arterioles to the passage of blood laden with excretory matters, nitrogenised waste, or imperfectly oxidised material present in

kidney disease or gout. If this condition of tension be long continued, it matters not from what cause, it will damage the arterial system; it will produce hypertrophy of the heart; the constant strain will affect the aorta and produce endarteritis; it will show its effect on the arterioles by their thickening and the hypertrophy of the muscular coat, and ultimately by degeneration.

But arteriole degeneration may be otherwise induced; it cannot, at least, always be traced to tension, of which it becomes a cause. Whether as cause or consequence, we usually have to deal with degeneration in association with tension, and the recognition of degeneration must be effected partly by the state of the vessel, but also by other general considerations. When the artery feels like a string of beads under the skin, the case is clear; but in the form first mentioned, in which there is no calcareous change, with the indications of tension, and the large size of the vessel, the inequalities detected as the finger is carried along its length, a sensation of resistance, stiffness, or toughness are the signs presented by the vessel. Together with these we consider the age, appearance, history, general condition of the patient, the state of the temporal arteries, cornea, conjunctiva, skin, &c.

When a diagnosis of advanced arterial degeneration is formed the prognosis is of course very serious, and all we can do by treatment is to obviate the evil consequences more or less imminent, and postpone as long as possible the inevitable result. The evils threatened vary in different cases. One of these is apoplexy. When the heart retains its vigor and continues to act powerfully while the flow of blood through the capillaries is obstructed, the liability of degenerate vessels to burst under the high pressure at which the circulation is maintained is obvious. On the other hand, if the heart shares in the structural changes and is weak, the languid movement of the blood in diseased vessels is likely to give rise to thrombosis and cerebral softening. When there is kidney disease, uræmia is of course a contingency to be feared. But the prognosis of an attack of acute disease of any kind is made more serious by the existence of arterial degeneration.

I propose to illustrate these statements by cases which have been under my care, and more especially by cases in which the arterial condition has actually furnished a basis for prognosis subsequently verified by the result. Every day we see cases in which we reason backwards and explain the occurrence of apoplexy, &c., which we are called upon to treat, by the state of the vessels; but I am anxious to show you that we can reason forwards and predict, and if we can predict we can sometimes prevent.

The first case is that of a Scotchman, aged fifty-two, who came under observation in May, 1873, with the following history of himself. Five months previously, while apparently in good health, although he had felt conscious for some months that he was unequal to business at times, and his hands often became blue and cold, he was taken with a sudden giddiness; he did not fall, but was unconscious from fifteen to twenty seconds. On recovery he felt weak in his arms and legs. He had never been well since, and had always been under treatment. For some time he was at an hydropathic establishment, where he tried the water cure. His was almost the worst case possi-

ble for such treatment, and he became worse. He was treated also, at one time, with a "bitter syrup," which made him insensible; this was probably syrup of chloral hydrate; he was none the better for it. He did not look his age, was well fleshed and had good color in his face, but was a little sallow and puffy under the eyes. His expression was dull, and he had a look of want and energy. There was somewhat of a renal appearance about him, but there was no albumen in his urine; its specific gravity was 1018, and it was of good color; at one time there was a faint turbidity by heat, which was not quite removed by acid. At times he felt giddy. His arms were weak and his hands cold and purple. His walk was weak, but he was able to stand with his eyes shut, and on either leg, alone. His speech was slow but distinct, his voice weak and monotonous, and he could not write well. He frequently had hesitation in swallowing liquids, feeling unable to do so; but there was no return by the nose, and no choking. He soon became confused when talking or thinking, and made many mistakes. He always fell asleep after dinner, and slept heavily at night; he had also become apathetic, whereas formerly he was energetic.

Here was a case of damage to the medulla oblongata. The pulse gave the key to its character; it was long and hard, and the artery presented inequalities to the touch; the temporals also, especially the left, were tortuous and hard. The heart sounds were of a tic-tac character—that is, equidistant and similar—and were loud. The aortic second sound especially was loud and booming and was heard over a large area. The aorta itself was dilated; it could be felt above the sternum; and there was dulness across the upper sternum.

His vision was not good. The pupils were small, and there was slight arcus senilis at the upper part of the cornea. The ophthalmoscopic examination was not satisfactory, only an imperfect view of the fundus being obtainable in the left eye; bright white spots were seen near the yellow spot, and the right disc was red and ill-defined.

My diagnosis was, disease about the medulla, probably a limited hæmorrhage. The prognosis I gave from the state of his vessels was bad; some improvement might be obtained, but sudden death from apoplexy was to be anticipated. I was unable to find a cause for the bad state of his arteries, and this perhaps made the case of a more serious nature. The treatment I adopted was an aperient mercurial pill, to reduce the arterial tension, iodide and citrate of potash, phosphorus, and cod-liver oil. Unmistakable, indeed remarkable, improvement took place at first, but after one or two warnings, two months after I first saw him he had his attack of apoplexy, which, from the symptoms, was apparently hæmorrhage into the pons and medulla, and died. Unfortunately, I was away from town at the time and no post-mortem was obtained.

Another case of extreme interest is that of a gentleman, aged sixty-two, whom I was called to see in June, 1873. He was suffering from a well-pronounced but mild attack of gout; but his family were uneasy about him, for lately he had been getting paler, feebler, apathetic, easily fatigued, disinclined for exertion, and, indeed, incapable of it, for he soon became out of breath. The gout, in this case, was comparatively unimportant; it

was its results that were dangerous. He was a country gentleman; but his habits were not active, as is usual with his class, though his living was of the usual generous description, and he took beer of his own brewing, which was very good, sherry, and port daily. It was not, therefore, to be wondered at that he had had gout for seven years, and with it the frequent accompaniment of eczema and other gouty troubles.

He had a terrible family history, as I learnt later. As I sat on Sunday in the family pew of the village church I was struck with the history recorded on the long series of his ancestral monuments. They were a long-lived race, averaging from eighty to ninety years for many generations; but his father died at seventy-three or seventy-four, and already one younger brother had died of Bright's disease and apoplexy, and he had another the subject of renal disease and paralysed.

His face was rather sallow and pale, with faded red on his cheeks. He had a well-marked arcus senilis all round the cornea. His pulse, which was rather frequent, was long and hard. He had slight reduplication of the first heart-sound at the apex, and a loud second sound at the base. His urine was of sp. gr. 1013, pale, not quite clear, and it had a trace of albumen, which came and went. Here was a typical case of so-called arterio-capillary fibrosis, with contracted and granular kidneys, due to true gout. He had high tension, damaging his arteries; and this or the same state of blood which had given rise to the tension had affected his kidneys. His condition fluctuated with the variations in the arterial tension. This, therefore, indicated the treatment, which was directed to reducing it by every means at our disposal. I ordered him mercurial aperients, though I was aware of his kidney disease, saline purgatives, iodide of potassium, citrate of ammonia, and then tincture of iron. His diet was also strictly regulated; it was made to consist largely of milk, eggs, and fish. He was directed to stop his wine and beer, and to take whisky and Apollinaris water. This was followed by wonderful improvement, and he went for change to the seaside. While there he had an escape for his life from constipation, which he neglected. He came back, however, much improved. All went well with him till the spring of 1874, when the election business, with its attendant exertion, exposure, and excitement proved too much for him, and he knocked up under it. He now began to have severe nocturnal dyspnoea, the attacks coming on at 2 or 3 A.M. There was a wheezing sound, but air entered the lungs quite freely, and the dyspnoea was, in fact, cardiac. There was general arterial spasm, the pulse being even smaller, longer, and harder than usual, and the reduplication of the first heart-sound more marked; the left ventricle was, apparently, unable to force on through the arteries an adequate amount of blood, and, accordingly, too little reached the right ventricle and lungs. Possibly the attacks were in part uræmic. Mercurial and saline aperients were again given, and were followed by great relief. A fortnight later he had sudden loss of sight, which came on while stooping. Before I saw him this had improved, and he saw better; but there remained a peculiar limitation of the field of vision—all appeared dark except what was immediately before him. The ophthalmoscopic examination showed the retinal arteries to be so small as to be scarcely visible, and

there was oedema around the disc. The high tension was now again remarkable. The sight gradually improved; but improvement in the general health was very slow. He went to the seaside in August. Here he again neglected his bowels, which became constipated. This brought on a profuse attack of hæmorrhage from the bowel, by which he was completely prostrated; but he once more improved in every respect. In February of this year he had again severe dyspnoea, with pulmonary congestion, and finally came the attack of apoplexy which I had so long feared.

Arterial degeneration, chronic renal disease, and arterial tension are often so combined in the same case that I have difficulty in deciding under which head to describe some of those I wish to relate to you. It was so in the last case, but I considered the arterial condition the one which most threatened danger, and so I take it to have been in the following, in which good results, at one time un hoped for, attended the intelligent and persevering application of principles of treatment indicated by the pulse, by my friend Dr. Kilner Clarke, of Huddersfield.

The patient, a gentleman aged fifty-six, engaged in commerce, had had fair health till twelve months before I saw him, which was in March, 1874. He was at this time suddenly seized with great giddiness one morning, and for the remainder of the day was continually vomiting. This was set down to biliousness, but he had never been free from giddiness since; was nervous, and started readily; was soon tired; and his memory was impaired. A slight difference was observable in the muscular markings of the two sides of the face, these being smoothed out a little on the left. The temporal arteries stood out; the pulse was rather small, very hard and long; the arterial tension was extreme, and a short systolic puff was heard over the aorta. Urine of sherry color; sp. gr. 1009; no albumen. Ophthalmoscopic signs negative.

Dr. Clarke had recognised these facts, and ordered appropriate treatment; but a physician consulted in London advised it to be left off. Soon afterwards I saw the patient, and the line of treatment was resumed: one grain of mercury pill, one-third of a grain of extract of colchicum, and two and a half grains of compound colocynth pill, being given twice a week; and three grains of iodide of potassium, ten grains of bicarbonate of potash, five minims of colchicum wine, with spirit of ammonia and tincture of oranges, three times a day. There was improvement, but the patient had work and anxieties in his business for which he was unfit. In December he had unilateral convulsive attacks, and albumen appeared in the urine. When I saw him in January his walk was feeble, his speech indistinct, and his aspect that of cerebral mischief. Still his general condition was much better, his arteries were softer, his tissues more healthy, and his color fresher and less sallow; so that, with cessation of business worries, now absolutely necessary, I was not without hope of improvement. The patient remained entirely under Dr. Clarke's management; and when I last heard of him, in June, he had shaken off the cerebral symptoms, and was so much better in every way that he was returning to business, from which he had definitely retired.

I have now under observation a lady, the wife of a medical man, in whom I predicted cerebral hæmorrhage, and in whom also it has occurred.

She suffered from violent palpitation, faintness, and feeling of lowness, for relief from which she had resorted to stimulants. She had also become weak and liable to attacks of vertigo. From this and from timidity she had almost entirely given up out-door walking. I never met with a case of such extreme high tension. The pulse-rate was habitually nearly 120, the arteries everywhere prominent and tense. She had a rather bloated, red face, which was still more disfigured by acne; and her aspect was that of extreme plethora. I obtained by much urging a modification of her diet, but I could not prevent recourse to stimulants, which were not, however, taken to excess. I only saw her twice, early in the year, but felt certain of the condition which threatened her, and gave a prognosis of apoplexy. In May she had her first distinct warning, which came in the shape of hæmorrhage into the left retina, with loss of sight. In June she had more severe and alarming symptoms, a meningeal hæmorrhage having apparently occurred. On the night of the 6th she became restless and irrational in her talk, and then a severe attack of convulsions came on; she had altogether four attacks of convulsions within twelve hours, which were followed by prolonged loss of consciousness, and when recovering from this she was in a state of extreme excitement, with delirium and delusions and complete loss of memory; she became also extremely obstinate and violent.\*

But, besides furnishing a basis for prognosis, arterial degeneration often explains to us a long train of miserable nervous symptoms coming on late in life—loss of energy, depression of spirits, a feeling of confusion in the head, sleeplessness, transitory loss of consciousness. I have in mind the case of a lady for some time under my care, formerly energetic, active, full of spirits, now prostrated or confused by the slightest exertion, bodily or mental, scarcely able to walk, or to write a letter, or to command her attention, sleepless, and persecuted by a constant pain in the back of the head. She is relieved by the very means which her weak state would seem to contra-indicate.

You have seen also in two cases, one still in the hospital, the other only just discharged, how convalescence from slight illness has been protracted almost indefinitely for no assignable reason except that the arteries were degenerated. In one, however, the heart was weak, and till restored by prolonged rest in bed its systole gave neither impulse nor first sound. Both the patients were women, who, nearly up to the time of admission, had been able to attend to their duties, and both came in for subacute rheumatism. The first, a monthly nurse,

aged fifty-seven, had a slight attack of pneumonia a few days after her admission, but this did not at all account for her extreme weakness and slowness in recovery. It was more than three months before she could stand, and when she left the hospital, at the end of four months, she could only just walk the length of a small ward. The arteries were small, irregular, resistant, certainly degenerated, perhaps on the way to calcareous change; and this, I think, explained the difficulty attending the re-establishment of the nutrition and restoration of strength. The case of the other patient was very similar, and I need not give the particulars.

When advanced calcareous degeneration of the small arteries exists it can scarcely escape attention, even on the most superficial examination. The radial feels, as I have said more than once, like a string of small beads when the fingers are carried with the skin along its length. All I need do is to remind you that with the vessels in this condition a very slight ailment may prove fatal. I have had no marked instance in the wards lately, and to read you notes of cases I have had under observation formerly would simply be to give you accounts of the complications by which the patients were carried off. In one the chain of events was bronchitis, œdema of feet gradually progressing to general dropsy, failure of right heart with enlarged liver, and albuminuria. In another, attacks of giddiness, loss of energy and memory, indistinct and slow articulation, later a gradual impairment of the faculties, occasional escape of urine and fæces in bed or into clothes, and ultimately the entire train of symptoms attending cerebral softening.

I propose to take up this subject again on another occasion, for I find I have not time to complete it to-day. It is not merely in forming prognosis that a careful study of the indications furnished by the pulse is useful, but also in treatment, and of this I hope to give illustrations.

## Lectures

ON SOME

## NERVOUS DISORDERS THAT RESULT FROM OVERWORK AND MENTAL ANXIETY.

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### LECTURE III.

GENTLEMEN,—I described to you in my last lecture many of the symptoms and signs of functional disturbance in various organs which may have their origin in mental and emotional influences. I now wish to point out to you that some of the most formidable disorders of the nervous system may result from the same causes. A study of the more serious consequences of excessive brain work and of mental anxiety and shock will

\* The treatment consisted chiefly in free purgation. Venesection was to have been practised had convulsions again come on. Bromide of ammonium was given for a short time. A farinaceous, milk, and fish diet was prescribed, and stimulants forbidden. When this lecture was delivered, the mental powers appeared to be so much shaken that anything like complete recovery was scarcely hoped for, especially as improvement of intellect did not at all keep pace with the improvement in the patient's general condition. To my astonishment, the arterial tension was gradually reduced, the pulse became perfectly soft and natural, without being weak, and the rate came down to 72. The arterial degeneration I had diagnosed did not, in fact, exist; and I think the tension, which was quite the most remarkable I ever met with, was due to the frequent and powerful action of the heart, which forced blood into the arterial system faster than it could escape by the capillaries, except under great pressure. For some weeks the behavior was peculiar and memory all but lost. Now, however (July 12th), except that the memory is still weak, the patient is well.

serve to impress upon you the practical importance of an exact diagnosis and appropriate treatment in the early stages of these disorders of the nervous system.

There are few diseases more terrible than epilepsy, and this dreadful malady is one of those which are often traceable to causes such as we are now considering. Many years ago, when I was physician to the Public Dispensary in Carey-street, and afterwards when seeing out-patients as assistant-physician of the hospital, I obtained the histories of a large number of cases of nervous disease, and I will now give you, as briefly as possible, the results of that inquiry, so far as relates to the exciting causes of epilepsy. On analysing the histories of 87 cases of epilepsy, I found that no less than 28 were probably the result of what are commonly called and understood as mental influences. In 5 the fits were the result of some obvious bodily disease or of intemperance, and in 4 no probable cause could be assigned. The cases of epilepsy to which I have referred as having their origin in influences acting primarily on the mind, naturally divide themselves into two classes, distinct, though closely allied. 1. The first class includes those cases in which epilepsy has resulted from great terror or excessive and sudden grief, and in which the first fit comes on almost immediately after exposure to the exciting cause without being preceded by warning symptoms. 2. In the second class are included those cases of epilepsy which arise from excessive mental work or continuous grief and anxiety, and which are preceded for a variable period by warning symptoms. Out of the 28 cases to which I have referred, 11 belonged to the former class and 17 to the latter.

Amongst the exciting causes which have acted suddenly in producing epilepsy, I may mention the sight of a supposed ghost which had been dressed up in order to terrify. In one case the ghost was a boy covered by a sheep-skin. One girl attributed her fits to the fright of hearing a knocking, which she believed to be supernatural. A woman became epileptic on hearing of the sudden death of a friend; she felt, as she said, "a sudden turn and agitation," and within an hour she had a convulsive fit. A man walking along the street saw a workman killed by falling headlong from a scaffold close to his feet. Instantly the horrified passenger fell in an epileptic fit, and he had been epileptic for years when I saw him and obtained his history. A boy was playing in the street, when a policeman terrified him by threatening to take him to the station for making a noise. He ran a few yards, and fell in a fit at the door of his house. The fits recurred, he became paralytic, and died two years afterwards.

When epilepsy results from a sudden mental shock, the first fit usually occurs immediately or within a few hours; but in some cases an interval of days, weeks, and even months, may intervene, the patient meanwhile manifesting signs of nervous disorder. The most remarkable example of a mental shock renewed and aggravated by nightly recurring dreams, and at length, after an interval of two years, culminating in epilepsy, is afforded by the second case, whose history I gave in my first lecture. From what I have seen of analogous cases, I believe that the habit of dreaming might have been checked and the chain of morbid phenomena broken by a judicious use of soporifics at

any time during the two years before the occurrence of the epileptic convulsions.

Those cases of epilepsy which result from excessive brain work, from anxiety or continued grief, are usually preceded by a train of nervous symptoms; and it is during this period of what we may call the incubation of the disease that preventive measures may be resorted to with a reasonable hope of success. The symptoms which precede the full development of epilepsy are similar to those which I described in my last lecture as resulting from mental shock and anxiety: terrific dreams and visions, starting, struggling, talking, moaning, and sometimes screaming during sleep; a sense of fatigue in the morning, the patient often declaring that he is more tired when he gets up than when he goes to bed; often there is a sense of pain, weight, or constriction in the head, loss of appetite, disorder of digestion, and general weakness. These symptoms continue for a variable period, sometimes for many months, but in other cases only for a few weeks or even days, before the occurrence of the first epileptic fit, which generally takes place in the night, and during sleep. The nocturnal disturbances then continue, sometimes in an aggravated form; and after an interval, which varies from a few hours to several months, a second fit of epilepsy occurs, and so by degrees the disease is established.

Now, let me here guard against a possible misconception. I do not maintain or believe that every overworked or anxious man whose sleep is disturbed by terrifying dreams, or who talks, screams, or starts up in his sleep, will necessarily become epileptic or insane. Such an opinion would be very unreasonable, but, expressed in the hearing of one of these nervous patients, it might contribute much to bring about its own verification. The symptoms which I have described indicate, as the doctor says of Lady Macbeth, "a great perturbation in nature," which, if neglected, may lead on to epilepsy, or an outburst of delirium or mania. Obviously, then, they demand the most earnest attention, with a view to ascertain their cause, and then to find a remedy.

CASE 6.—One of the worst cases of epilepsy from overwork which I have ever met with was that of a youth, R. M.—, who at the age of eighteen was a patient at the hospital. The disease had commenced about five years before. He was then a very intelligent boy, of a somewhat excitable temperament, and he was employed as a reader in a printing office. He worked at that occupation about ten hours a day in a close room. For about a month before the commencement of the fits he often complained of feeling tired and stupid, and he suffered from headache; at the same time, too, his parents noticed that he talked much in his sleep, and sometimes walked about the room in a state of somnambulism. At length he was seized with a violent fit in the night, and after a few days he had a second fit. The fits then recurred frequently, his memory and most of his mental faculties gradually became impaired, and he was soon rendered unfit to continue his occupation as a reader. The boy's parents were healthy, and there was no evidence of hereditary tendency to nervous disease. Now there is reason to believe that a holiday or a diminution of his daily work, with the aid of some sedative at night during the month in which the warning symptoms of coming mischief presented themselves, might



have saved this poor boy from the misery of an incurable epilepsy.

The following case presents some interesting and instructive features:—

CASE 7.—In March, 1851, I was called to see a merchant's clerk (J. R. S—), aged twenty-eight. I was told that he had been delirious for three days. I found that his head had been shaved, his temples leeches, and his neck blistered, and he had been kept on a rigidly low diet. The result of this treatment had been an increase in the violence of the paroxysmal delirium, but at the time of my visit he was quiet and answered questions rationally. His skin was cool and moist, his pulse moderately quick, and his pupils natural. I ascertained, not only from his family, but also from his employers, that he was a very steady and temperate man. His wife told me that for several weeks before his illness his nights had been very disturbed; that in his sleep he had talked almost incessantly of his business; that in the morning he appeared unrefreshed; that his appetite had been bad; and that he had been gradually losing strength. When I inquired for the cause of all this disturbance, I was told that the fatiguing and harassing nature of his employment was the only cause for anxiety of which his family were aware. It seemed evident that the case should be treated as one of delirium from exhaustion; and accordingly I prescribed a mutton chop with a glass of porter, and at bedtime forty drops of laudanum. The next day I found that he had slept well and there had been no return of the delirium. He rapidly recovered, and at the end of a week he returned to his employment. About three weeks after he had returned to his work I was asked to see him at his employer's warehouse, where I found that he had suddenly fallen in an epileptic fit whilst engaged in washing his hands. I again inquired particularly for sources of anxiety, and I was again told by his family that overwork was his only trouble; but his employers, who were friends of my own, assured me that there was nothing in his work to trouble a healthy man. The fits recurred again and again. His wife told me, in the month of October, that his nights were constantly disturbed by dreams, and that he talked, moaned, and frequently called out in his sleep. He became a confirmed epileptic, was soon compelled to give up his situation, and about two years afterwards died. It was not until the month of February, 1852, nearly a year after I first saw the patient, that I learnt the real cause of his nervous disorder. His father then told me that my patient's wife was a confirmed drunkard, and that when drunk she was extremely violent; that she had more than once threatened to stab her husband, and that on one occasion she had actually wounded his hand with a knife. My informant had from the first been aware that this was the cause of his son's misery and restlessness; but he was unwilling to speak of it, even to me, until matters had become desperate. It is evident that the information thus tardily given is the central fact in the history of the case, and until its sad domestic history was revealed there appeared no satisfactory explanation of the poor man's continued and increasing nervous disorder.

I have seen other cases similar to this within a comparatively recent period in private practice, but for obvious reasons it would be inexpedient to publish them.

The delirium which occurred in the early period of this case is a good example of the kind of delirium which is sometimes brought on by intense mental anxiety in persons of strictly temperate habits. Great and sudden terror may be followed almost immediately by maniacal delirium. Quite recently we have had in the hospital a boy fifteen years of age, who became violently delirious immediately after being terrified and assaulted by two men as he was returning from his work in the neighborhood of London. But the delirium which results from overwork and anxiety rarely if ever occurs without being preceded for a variable period by disturbed sleep, and the other signs of nervous disorder which I have before described. Sleep-talking and somnambulism are amongst the most frequent precursors of delirium. When an anxious patient is talking in his sleep he will sometimes answer questions as if all his faculties were alive, and yet, when he awakes, he may have no recollection of what he has said or heard. In other cases he appears, while sleeping, to be carrying on a conversation with someone whom he imagines to be present. I was once told by a very intelligent woman that her husband, who ultimately became insane, was of what she called "a very close disposition," so that he would never willingly speak of his troubles to her or to anyone; but whenever he had been unusually worried, he talked so much in his sleep that she heard from him then, not only that he was anxious, but also the cause of his anxiety. "Infected minds to their deaf pillows will discharge their secrets." The transition from a state of delirious sleep to delirium in the waking condition may be direct and rapid, but there sometimes occurs a transient intermediate stage, during which a man starts up in a state of confusion and terror, looking about him distractedly, and perhaps talking wildly, and recovering complete consciousness and self-possession only after being frequently spoken to and roused by being touched or roughly shaken.

CASE 8.—Many years ago, when I was house-physician of the hospital, I had under my care a shoemaker whom I had known for some time as an excitable man of intermittently intemperate habits. He had now a sharp attack of gout, and one evening he astonished the ward by setting up a loud and continuous shouting. I was called to him and found him still roaring at the top of his voice, and as he continued this in spite of my loud remonstrance, I took him by the shoulders and gave him a vigorous shaking. This immediately stopped the noise. The man had been terrified by a dream, and he was only half awake until I roused him by the shaking.

In some instances the excitement on first awaking is accompanied by a temptation to commit suicide, or to do violence to others; and the patient will afterwards speak of these feelings as most distressing and terrible. In other cases he begs that he may not be left alone lest he should destroy himself, or that those whom he most loves should remain away lest he should injure them. These symptoms, if permitted to continue unchecked by judicious treatment, may be quickly followed by an outburst of maniacal delirium, or by an epileptic seizure, or sometimes, as I have seen in several instances, by both these terrible consequences in succession. In no case whose history I have investigated has an outbreak of delirium of this kind occurred without being preceded for a

longer or shorter period by some of the premonitory symptoms which I have described. I have heard and read of men becoming suddenly delirious and mad without warning or any discoverable cause. I have never seen such a case, but I have met with more than one which, without a careful examination, might have passed for such—cases in which there was a deep and abiding cause for anxiety which was not revealed, even to the nearest relative or friend, until it was discovered after it had wrought irremediable mischief on the nervous system of the patient.

**CASE 9.**—One such case was that of a clergyman whom I had known for some years as a man of powerful mind and body, until, to the surprise and grief of his family and friends, he suddenly, as it appeared, became insane, and subsequently epileptic, when he was just over thirty years of age. His habits were strictly temperate, but he was disposed to be over-anxious about his parochial work. His wife observed that his appearance and manner were changing; he became unusually reserved and sometimes irritable. He was at a distance from all other members of his family, and his anxious wife had no suspicion either of the real cause of the change which had come over him or of the serious consequences which were threatened. At length he became suddenly and furiously delirious in the middle of the night. The mental disease continued and became complicated with epilepsy; and after nearly four years of suffering he died. Now the cause of this terrible calamity was not discovered until the time for prevention had passed. His income was limited, and insufficient for the wants of an increasing family; he was in pecuniary difficulties of which no one but himself knew until the state of his affairs was disclosed after his illness. He was naturally reserved, sensitive, and proud; and he had concealed his difficulties from his wife, probably from an unwillingness to distress her with a knowledge of them. Of course his own anxiety was intensified by this reserve, and by his not seeking that relief which might have been obtained if he had imparted his troubles to his family and friends.

**CASE 10.**—In September, 18—, I was consulted by an officer, aged forty-six, in a high position in the army and in society, on account of an attack of loss of consciousness, which had occurred while he was in bed three days before I saw him. I inferred from his description that he had had an epileptic attack. I observed that he had what I have described as the "anxious eye"; but, in reply to my particular inquiries, he assured me that he was not overworked, and that he had nothing to trouble him. I saw him again in a few days, when I repeated my inquiries and received the same answer. In November his sister called to tell me that he was in the country acting very strangely, and evidently insane. I inquired for sources of mental anxiety, and was told that it had recently come to the knowledge of his family that some years since he had formed a *liaison* with a lady, by whom he had several children, and whom he had recently married. For reasons which need not be mentioned here, this affair had for some time caused him the most intense anxiety, and was without doubt the cause of his mental derangement. He came up to town in a state of maniacal excitement. I had a consultation with Dr. Monro and with the surgeon of the regiment. He was sent to an

asylum, where he was generally happy in the belief that he possessed boundless wealth. He had occasional epileptic fits, and after some months he had a rapid succession of epileptic attacks and died.

I could give the details of a considerable number of cases of whose history I have an intimate knowledge, in which consequences equally disastrous, though differing in different cases, have resulted from similar causes, and especially from the influence of suppressed grief, care, or anxiety, the cause of which has been neither known nor suspected by the patient's nearest friends, until it has been brought to light after the onset of some alarming illness—an attack of mania, or epilepsy, or paralysis. Now, in order to prevent these calamitous results, it is of the highest importance that the true nature of these interesting cases should be recognised in their earliest stages, when preventive treatment is often attended with complete success. It often happens that we are consulted by an anxious patient who believes that he has some serious organic disease, and who complains of some of those symptoms of nervous disorder to which I have so often referred. He feels certain that his heart, or his lungs, or his kidneys, or perhaps his brain, must be in a state of incurable disease. We notice the patient's anxious appearance and manner, and, after inquiring for other sources of disorder, we arrive at a positive conviction that all the symptoms have their origin in some disturbing mental influence. If, then, we express this opinion to the patient we shall probably so far gain his confidence as to obtain from him an acknowledgment of trouble and anxiety, of which perhaps he had never before spoken to anyone. Or, if he hesitate, as perhaps he may, to make a confessor of his physician, we may at least succeed in directing his attention to the true source and nature of his sufferings, and so induce him to confide in some friend, and thus put himself in the way of obtaining needful advice and assistance, while we carry on the medical treatment of his case. In this way we may often be instrumental in preventing the development of serious disease which, when it has passed beyond the initiatory stage, is cured with difficulty, if at all; while, on the contrary, an error of diagnosis—a failure to appreciate the nature and origin of the symptoms—may be attended with very disastrous results, partly by confirming the patient's hypochondriacal fears as to his health, and partly by suggesting a plan of treatment the reverse of beneficial.

Before leaving this part of my subject I may mention that when a patient has once been delirious or insane from the effects of mental anxiety, he is very liable to suffer from restlessness or to have his sleep disturbed by frightful dreams and visions, if at any time subsequently he is weakened by illness or over-fatigue, or exposed to mental worry. A woman who has once been in an asylum has several times complained to me of these nervous symptoms, and on each occasion she has been quickly relieved by an opiate at bedtime for a few nights in succession. In such cases it is probable that the mere dread of a return of the disease is often a source of great anxiety; and the same observation applies to epileptic patients. One man told me that he always sleeps soundly for a few nights after he has had a fit, and he explained this by saying that for some time after the occurrence

of a fit he has no fear of an immediate return, which at other times he so much dreads that he cannot sleep with comfort.

Amongst the nervous diseases which are frequently the result of mental shock, *chorea* or *St. Vitus's dance* is well known to be thus excited in a very large proportion of cases. One of the most interesting problems in pathology is to explain the fact that chorea may result from such apparently different causes as the mental influence of terror and the mechanical plugging of minute cerebral vessels by fibrinous particles detached from an inflamed endocardium. I do not propose to discuss that question now, neither shall I attempt to account for the fact that a similar mental shock will excite in one patient delirium, in another epilepsy, and in a third chorea; but I wish to impress upon you a fact of practical importance with reference to the preventive treatment, which is this: that as in cases of delirium and of epilepsy excited by mental shock, so in cases of chorea, the symptoms of the special nervous disorder may not commence until some days after exposure to the exciting cause; but on careful inquiry it will generally be found that in the interval the patient's sleep is broken and disturbed by dreams, as a result of which the effect of the original mental shock is perpetuated and intensified until the nervous disorder reaches its full development.

CASE 11.—At the present time (December, 1874) I have in the hospital a boy fifteen years of age, in whom a severe attack of chorea was excited by fright. As he was walking in the dark a large black dog jumped over a fence by the side of the road, and came so close to him as to knock a basket out of his hand. He was very much frightened, but a week elapsed before the symptoms of chorea appeared. In the meantime, however, his sleep had been disturbed every night by terrifying dreams, which made him more and more nervous. The symptoms since his admission have rapidly yielded to the soothing influence of ten grains of chloral hydrate taken three times a day.

Now, the practical lesson which I wish to convey to you is this, that in all probability if he had taken a ten-grain dose of chloral at bedtime for three or four nights after his fright he would have slept without dreaming, his brain would have been soothed, and the mental shock therefore would not have developed into an attack of chorea.

The nervous symptoms which result from mental shock and emotional excitement sometimes assume the form of *hysteria*. Let me remind you that this disease is not necessarily, as its etymology would seem to imply, a result of uterine disease or irritation. Every one of its characteristic symptoms may be fully developed, not only in those who have a healthy uterus, but in those who do not possess a uterus. It is more common in women than in men, for the reason that the more excitable nervous system of females renders them more liable to this form of disorder. The globus hystericus—the sensation of a ball rising into the throat and threatening suffocation—is the form of hysterical symptom which I have observed more frequently than any other in anxious patients of both sexes. It is always a distressing symptom, and it often alarms the patient greatly. This painful sensation is often excited by some sudden mental emotion, and it may occur at any period either of the day or night. In many cases, especially in men, it has been complained of only at

night, and it has appeared to be connected with the distressing dreams by which the patient has been nightly disturbed. The dreams and the hysterical globus have both been cured by the same means.

CASE 12.—One of the most remarkable cases of this kind was that of a man sixty years of age, who assured me that for about a year he had scarcely passed a night without being disturbed by a frightful sense of suffocation, for the relief of which his son and daughter often had to assist him to the open window. He had no cough, nor was there any evidence of disease within the chest. His countenance was expressive of great mental anxiety, and he admitted that he had been much troubled by circumstances, the particulars of which he did not communicate. I prescribed a grain of opium in a pill every night at bedtime. He came again at the end of a week and told me that since taking the pills he had slept well, and had not once been disturbed by the horrible sense of choking which had so long distressed him. From that time I saw him no more; I therefore conclude that he had no return of his distressing complaint. I have seen many cases similar to this, as regards the symptoms, the etiology, and the results of treatment.

I have no doubt that in some cases the nervous sensation of globus is excited by some local irritation of the throat. When a nervous woman, or even a very nervous man, gets a common sore-throat, the distress and alarming sense of impending suffocation are often quite disproportioned to the physical changes in the throat which we can see with the laryngoscope.

CASE 13.—A poor woman who was very anxious and much overworked had a slight choking fit while she was eating, and afterwards she felt sure that some substance was still lodging in her throat. She went to one of the hospitals, where the house-surgeon passed a probang, but that rather increased her distress. When she came to me I found the mucous membrane of her fauces and pharynx congested, but her intensely anxious face and nervous manner, and her description of the "rising" in her throat, were the most significant facts. It was not until after many days, and then very gradually and with occasional relapses, that she escaped from the conviction that some solid mass was sticking in her throat and threatening suffocation.

CASE 14.—Not long since I was consulted by an unmarried lady, about forty-five years of age, who for several months had been disturbed nearly every night by attacks of choking, which compelled her to sit up in bed. She had a pallid and delicate, but not an anxious look. On examining her throat I found that she had a very long and slender uvula, which was always in contact with the back of her tongue. I cut off about two-thirds of the uvula, and from that time she had no more attacks of suffocation. In this case I have no doubt that the distressing attacks of suffocation were excited during sleep by the elongated uvula.

## Clinical Lecture

ON A CASE OF

## ECCHYMOSIS OF THE SCROTUM.

*Delivered at St. Bartholomew's Hospital,*

By WILLIAM S. SAVORY, F.R.S.,

Lecturer on Surgery and Surgeon to the Hospital.

GENTLEMEN,—I bring this case under your notice chiefly because it affords me an opportunity of fixing for a while your attention on an important feature of the affection commonly called Pyæmia, or often now Septicæmia, but which I prefer to speak of more simply, yet more comprehensively, as blood-poisoning: chiefly on account of this, yet also because it illustrates some other very interesting facts in pathology and practice.

G. L——, aged thirty-one, a carman, was admitted into the hospital on the 10th of last December. During the dense fog which then prevailed he missed his way, and drove into the West India Dock. A considerable quantity of blood was extravasated into the scrotum, penis, and perineum. All these parts were black and blue, distended, and tense; but into the cellular tissue of the scrotum, especially on the right side, a very considerable quantity of blood was infiltrated. It was larger than one's two fists put together, and the skin over it was very black and tightly stretched. The state of the integument and its direct relation to the mass of blood beneath, which could be felt to be fluid immediately under it, and in evident continuity with that in the penis and perineum, showed plainly that the blood had escaped into the cellular tissue of the scrotum. There was no evidence of any hæmatocele—of hæmorrhage into the sac of the tunica vaginalis.

Now, when a part has been severely bruised, so as to rupture some of its vessels, the amount of blood which will escape depends on—(1) the vascularity of the part, and (2) the laxity of the structure. Hence hæmorrhage into the eyelids and scrotum is especially apt to be extensive. (3) The idiosyncrasy of the person—his tendency to bleed—the state of his tissues. Every one knows how widely persons differ in this respect. Some people, especially fat women advanced in life, are bruised by a mere touch; nay, sometimes the degenerate vessels will give way without direct violence of any kind. I may mention here a remarkable example of this.

A very fat elderly woman was brought to the admission room of the hospital on account of some sprain or other injury to the back. She was ordered into Stanley ward, and as the porters were carrying her in the sedan chair up two or three steps they gave her a sudden jerk. She started from fear of being upset, but it was quite clear that she was not struck anywhere. Shortly after she had been placed in bed, however, it was noticed with surprise that the poor woman had a pair of very large black eyes. We all were sure that there was nothing of this when she came to the hospital, and she could in no way account for the change. There was no suspicion of any direct

violence, and there can be no doubt that some of the vessels of the eyelids had given way from the severe shake. This led, of course, to a careful examination of the heart, the first sound of which was very unsatisfactory; but there was no evidence, in her respiration or elsewhere, of any material embarrassment of the circulation. But what was anticipated happened shortly after. She died suddenly in her bed.

Finally, the extent to which bleeding proceeds is largely influenced by the conditions to which the injured part is subsequently subjected.

Now what was to be done in the case of the carman? Clearly nothing in the way of active interference. We had to rely on rest and time, watching meanwhile to meet any untoward symptoms, should they arise.

What may happen, then, when blood is extravasated into the cellular tissue without breach of surface? The surrounding tissues become stained, and if the effusion be subcutaneous we have the familiar characters of a bruise or ecchymosis. The integuments are discolored; they present a livid red, or dusky blue tint, over an area which gradually extends and becomes lighter at the margin. The tint, when recent, varies from dark purple to crimson, being, no doubt, chiefly determined by the degree of exposure to the air. Thus blood effused into the conjunctiva even acquires rapidly, as is well known, a bright scarlet hue. Then, as the blood disappears, various shades of violet and olive-brown are intermingled. By and by the part becomes greenish, then at length yellow, and this slowly fades through pale lemon until the skin regains its natural color.

The most favorable result of an ecchymosis is that the effused blood is absorbed. At first, supposing previous coagulation, the liquid portion or serum disappears with more or less of the coloring matter dissolved in it; then the coloring matter, set free by the disintegration of the cells, is taken up, and finally the fibrine, which previously undergoes a kind of fatty degeneration. It may be a question, however, whether all the fibrine which is formed under these circumstances is absorbed so frequently as it is supposed to be. Certainly sometimes, and perhaps more often than is usually believed, a tough mass of fibrine remains, it may be in layers, which either hardens and contracts into an imperfect form of fibrous tissue or false membrane, or, more rarely, becomes penetrated by earthy salts and calcifies.

In large circumscribed extravasations which have coagulated there is, after a while, especially towards the centre of the clot, sometimes evidence of fatty degeneration. More rarely crystals of hæmatoidin are met with. But it is perhaps in the smaller and more diffuse ecchymoses that the coloring matter of the blood is thus transformed.

Reabsorption is of course the most desirable, and, fortunately, under favorable circumstances, it is the most frequent result. More frequent in diffused than in circumscribed hæmorrhage; for as blood coagulates in circumscribed effusions the fibrine is deposited at the circumference, and so separates the more fluid portion of the blood from the surrounding healthy vessels.

But everyone knows how blood thus let loose among the textures and excluded from air will sometimes remain for weeks, or even months, without apparently undergoing any material change. Its bulk does not visibly vary, and, when handled,

it still gives the impression of being fluid. And when let out under these circumstances, even after a considerable period, it will spontaneously coagulate more or less perfectly. It seems clear, therefore, that while shut in among the tissues coagulation has been delayed. We know, in fact that the coagulation of the blood is long delayed under these conditions. But again, when blood, so extravasated, is evacuated after a lengthened period, it sometimes still escapes in a fluid form, but now no longer with the power of coagulation under exposure, and having lost the characters of recent blood. It appears as a thick black fluid, like treacle somewhat diluted; and the microscope shows that the cells have, for the most part, broken up. Such collections, remaining for months, have been described as sanguineous tumours, and dignified with the name of *Hæmatoma*. Now, what previous changes have led to such a state as this? Has the act of coagulation been altogether prevented in blood thus dead, and perhaps putrid? Perhaps so, in some cases; yet here again it has, to say the least, been rendered highly probable, by the facts and elaborate arguments which Morrant Baker has brought forward, that there has been some degree of coagulation and a subsequent breaking down of the clot.

As a rule, no doubt the structural elements of blood thus effused gradually undergo disintegration—as a rule, the exceptions to which are perhaps not so numerous as they may at first sight appear to be. For, under the circumstances in which blood is usually extravasated, it is probable that slight hæmorrhage may recur at intervals for a long time, and this, with the addition of serum continually oozing from the walls of the cavity and simultaneous absorption, may account for the recent characters presented by some of the blood which has thus been long pent up.

Blood effused may become what is called “encysted.” This form of expression is an unfortunate one, for the term “encysted” is liable to mislead. The so-called cyst wall is, as Prescott Hewitt long ago showed in his admirable paper, nothing more than the outermost layer of the blood-clot, which, being closest to or in actual contact with healthy structures, most speedily and completely undergoes those changes which lead to its organisation and conversion into membrane. The boundaries of the space, however, in which the blood lies at the same time usually become more consolidated and defined, so that indeed sometimes the cyst-wall seems to be formed partly of the peripheral portion of the blood-clot and partly of the circumjacent tissue. The serum which usually constitutes the contents of the so-called cyst varies in tint according to age. The color, at first deepened by cruorine, gradually disappears, until the fluid may become either pale and clear or only slightly clouded by fat-molecules. Sometimes, however, clots of fibrine or of blood of various hues are found in the cavity; or, again, sometimes the cavity appears as a mere slit, the walls of the cyst being in contact. In this way is usually formed the well-known apoplectic cyst.

Not only may extravasated blood in exceptional instances become organised, acquiring ultimately the characters of fibrous or connective tissue, but it may become vascular. This is particularly well shown, as Prescott Hewitt pointed out, in the blood-cysts sometimes found in the cavity of the arachnoid. As he says: “After a certain period

the membranes forming these cysts become thoroughly supplied with bloodvessels, which may be seen in countless numbers permeating their whole structure; in severe cases it has been noticed that a minute network of vessels, most beautifully injected, is found at the margin of the new tissue, thus marking the point of union between the original and the false membranes.”

Suppuration may occur during the process of disintegration, pus forming around and mingling with the effused blood; and this, next to absorption, is perhaps the most frequent event of extravasation. This process is, of course, preceded and accompanied by inflammation, the signs of which are usually obvious. There is increase of the swelling; more pain, tenderness, heat, and perhaps fever. The skin over it becomes red, and the integument grows thinner, especially at the focus, which is at length perforated.

But above all, and especially for our present purpose, it is important to understand that, in the process which leads to suppuration, a new layer is quickly developed—in fact, a wall of granulation-tissue is formed, which intervenes between the fluid and the surrounding vessels.

Lastly, there may be rapid decomposition of the effused blood; but this, happily, is rare, for it is apt to be followed by poisoning of the system.

Whether there shall be reabsorption, suppuration, or putrefaction depends very much on the degree of damage which the surrounding tissues have sustained. If these can recover, reabsorption may follow; but if these are so injured as to break down and decompose, suppuration or decomposition of the blood must inevitably occur.

It is clear, then, that even for the most favorable issue—absorption—a long time must at least be spent. Cannot this time be shortened? In a word, Why not at once let out the extravasated blood, and so bring to an abrupt close a course which is otherwise so tedious and uncertain? Why not! Because so long as blood is thus shut up in a close cavity, even when not absorbed, it may remain for an almost indefinite period without decomposition, or at all events without such decomposition as may lead to mischief. But when such a cavity is opened and air admitted, active changes begin at once, and then soon follow inflammation and suppuration and great danger of blood-poisoning. Hence surgeons are very reasonably shy of any interference of this sort, and usually prefer to wait, however long, in the absence of inflammation, suppuration, or other evidence of decomposition.

Then, as a rule, to which there must be very few exceptions, you are not to think of opening a cavity into which blood has been recently extravasated.

Probably, however, some of you may be aware that this exceptional practice is adopted in “certain circles” as a time-honored custom; though here, no doubt, more in obedience to the exigencies of the hour than upon any calculation of the result. Prize-fighters are very apt to get black eyes; and, as the swelling rapidly increases, the lids become closed. Now, as the odds must be heavy against a blind champion, his friends and patrons secure for him temporary vision by puncturing the bruised eyelid, and then forcibly squeezing out its contents. That such a practice must occasionally lead to graver mischief I suppose there can be no doubt, although I should imagine that if

such a proceeding be adopted at all it might be done with far less hazard immediately after the escape, while the blood is quite fresh, and therefore would take longer time to decompose.

But, short of this rough-and-ready method, can the surgeon do absolutely nothing for an ecchymosis but wait and watch? Yes; he may, in the first instance, do something to check further effusion by the adoption of means calculated, under the circumstances, to restrain hæmorrhage—by rest, position, judicious pressure, and the cautious application of cold. The old popular plan of at once pressing the handle of a spoon or some other convenient instrument on the part of a child's head which has been struck is a remarkably good one. The pressure not only tends to restrain further hæmorrhage, but it diffuses the blood which has already escaped into the surrounding tissue, and so perhaps hastens its subsequent absorption. Then, when the chance of further hæmorrhage has passed by, there are numerous applications one or other of which has found favor at different hands—lotions of vinegar or of acetate of lead or of arnica, for examples. The tincture of arnica, more or less diluted, is an immense favorite with some. It certainly has, in some instances, a remarkable power of allaying the severe pain sometimes associated with a recent bruise, and it is believed to promote absorption. But there is this objection to its use. The tincture of arnica, even when much diluted, is very apt in some persons to produce irritation and inflammation of the skin. After its application for a day or two, erythema or eczema is prone to appear, and hence annoyance and distress; so when you use it be on the look out for this. Then, further on in the case, various stimulating liniments and iodine may be had recourse to, or another very popular remedy with pugilists—a poultice made of the scraped root of the black briony; there is, however, the same objection to this as to arnica—that it is apt to irritate and inflame the skin. When the amount of blood which has escaped is not very considerable, and there is much stiffness and tenderness of the injured parts, warmth and moisture are often very grateful in the form of water-dressing, fomentation, or even poultice. But the latter application is usually reserved for the occurrence of inflammation and suppuration, when, in spite of the prejudice with which many regard it, it often gives, I think, more relief than anything else.

To return to our case. The man lay at rest in bed, therefore, for about three weeks, in which time the blood disappeared from the penis and perineum, and almost the whole of it from the left side of the scrotum; but there was little or no reduction of the right side. At the end of this time there was here not only no promise of absorption, but there were signs of commencing decomposition; a blush appeared on the surface, and the integuments became infiltrated; there were heat and some pain. So, not without deliberation, I concluded that by evacuation of the blood I should not only save time, but, what was far more important, lessen the ultimate risk; for it seemed no longer possible that decomposition of the blood could be averted.

Yet I confess I did not decide on this measure without grave apprehension. Let me explain. I feared that the rapid decomposition which would follow the admission of air to the cavity would lead to blood-poisoning. But why should this

occur? Almost every day we see putrid fluids shut up, even under heavy pressure, in cavities among the tissues, and yet no poisoning of the blood supervenes. Why not? Here one might suppose are the very conditions for the production of pyæmia: a putrid fluid—animal matter in a state of active decomposition kept in constant contact, and this too under heavy pressure, with a raw surface. Many, indeed, write and talk as if such conditions were the only ones needed to induce pyæmia. They ignore the fact, which is nevertheless so familiar, that these conditions are continually present without the occurrence of pyæmia. I submit that the explanation of this is to be found in the fact that these cavities thus filled are bounded everywhere by a layer of new structure which is, or has the characters of, granulation tissue; and that this liminary membrane, when sound and unbroken, resists the passage of such fluids through its substance into the blood. They cannot penetrate it, or at all events, they do not pass through it in sufficient quantity or in such a state as to poison the blood. This, observe, is not a matter of mere theory. Actual experiment, in the hands of Billroth and others, has shown that granulation tissue, when healthy, has this power of resistance; and clinical observation, when directed to this question, leads to the conviction that when such tissue is deficient or unhealthy, or presents accidental breaches, decomposing fluids bathing wounds find an entrance to the blood. Further than this, at present, we cannot go. We know nothing of detail concerning the relation in which granulations stand to the act of absorption. But this great fact—for I believe it to be one—seems for the present almost enough. We may, however, bear in mind some of the facts relative to the influence of animal membranes on the act of absorption. The transmission of fluids through membranes is not the simple process it was formerly supposed to be. Not only is it much modified by the nature and surface of the tissue, but also by the character and composition of the fluid. It is now well known that the constituents of a fluid, apparently uniform, may be thus separated by a membrane through which one can and the other cannot pass; and that in this there is a means of analysis more subtle than chemistry can command.

Now this liminary membrane of granulation tissue or allied structure is found only under certain conditions. We are familiar with it as the superficial layer of healthy wounds, and we know that the wall of an ordinary abscess is similarly constructed. But the growth of such a structure requires time, and is the result of processes which need at least a certain measure of local health; and the formation of healthy pus is an associated act. But when extravasated blood collects in a cavity no such bounding tissue can of course at first exist. Time at least must intervene, and, at any rate for a while, such collections of blood can be circumscribed only by the tissues amidst which they lie. Whether such a wall shall be afterwards built depends on the kind of action which is set up in the surrounding tissues. The signs of this are usually those of inflammation and suppuration, such as we commonly recognise in the formation of an abscess.

In the case before us I saw no evidence that such a state of the part had been brought about, and therefore I was apprehensive that, when this cavity was laid open, any putrid matter that might form would gain an entrance to the blood. "Then,"

you will say, "why not have waited longer? Why did you interfere with such a prospect of doing mischief? Couldn't you have left it alone?" My answer is that it appeared to me to be a choice only of evils. I apprehended danger from exposure of the cavity; but I anticipated danger, too, from the decomposition of the blood as it was, and I hoped that by evacuating the fluid as completely as possible, and afterwards freely washing out the cavity with an antiseptic fluid, my patient might escape altogether from the danger.

Well, the cavity was laid open by a free incision, a large quantity of blood, changed into a thick black fluid like treacle, with broken clots, was evacuated, and the cavity was at once washed out thoroughly but gently with water and Condy's fluid.

And, now, mark what followed. This was done on the 2nd of January, and for two days there was no observation of importance; but on the 5th the report says: He has had two or three rigors, and has been sick. Complaints of severe frontal headache and thirst; no appetite; skin moderately moist. Temperature  $102.4^{\circ}$ ; pulse 106. On the following day (the 6th) the temperature was  $102^{\circ}$ ; pulse 95. Headache and aspect better. He complains of slight tenderness along the left spermatic cord and above the pubes.—7th: Temperature  $101.4^{\circ}$ ; pulse 96. Slight headache continues. In the afternoon it became severe, and there was recurrence of rigors and sickness, followed by profuse perspiration.—8th: Temperature  $100.4^{\circ}$ ; pulse 88; and he was altogether much less distressed.—9th: Temperature normal; pulse 68. Declares that he feels well. On washing out the cavity in the scrotum there was for the first time an escape of pus.—10th: Again slight headache. Complaints of severe pain in the left testis, and upward along the cord.—12th: Temperature  $104^{\circ}$ ; pulse 100. Rigors, vomiting, and severe headache; much pain; and now swelling of the left cord.—13th: Temperature  $104^{\circ}$ ; pulse 96.—14th: Temperature  $100.8^{\circ}$ ; pulse 80.—15th: Temperature  $101.2^{\circ}$ ; pulse 80.—16th: Temperature  $100.4^{\circ}$ ; pulse 80. Acute tenderness along the left cord; and now a sense of fluctuation there.—19th: Temperature  $100^{\circ}$ ; pulse 80. Since the last report the pain along the left cord has been severe, and fluctuation is now distinct. A free incision was made, and a quantity of laudable pus let out. No rigor or other disturbance followed. Mark this.—20th: Temperature normal; pulse 80. Altogether better.—21st: Feels quite well. Appetite returning. From this date he rapidly recovered, and soon left the hospital.

Now, really, it might almost seem as if such a case as this were given for our learning. In striking contrast to the collection of blood on one side we have on the other a collection of pus—an extravasation and an abscess. On the one hand fluid liable to decompose lies in contact with naked tissue, and when it does decompose the poison is absorbed into the blood. On the other hand, fluid liable to decompose is separated from the surrounding tissues by a new wall, which has been previously built up, so when it decomposes there is no absorption and no blood-poisoning, for I need hardly tell you that pus when exposed to the air will decompose. I said it was healthy pus—not putrid—when let out. But, of course, and especially in such a cavity as that which in this case remained, some pus must be retained, and must

under these circumstances rapidly change. And we know very well, as I have already said, and will repeat once more, putrid pus and other fluids are frequently seen in cavities and on wounds without the signs of poisoning of the blood. For my own part, I confess I cannot account for the contrast without having recourse to the wall of the abscess.

The great lesson taught by this case was never more needful than now, when, as during late years, in researches on blood-poisoning, attention has been called from the study of causes operating within, and has been directed wholly to those operating from without. Was this a case of "hospitalism," think you? Do you imagine that the determining cause of the mischief was in the ward, or the bed, or anywhere but in the condition of the injured part? The air with its germs was equally admitted to both sides—to the ecchymosis and to the abscess; and will not pus decompose as well as blood? Whence, then, the difference, oftentimes as great as that between life and death, which in this striking instance is forced upon the attention of everyone?

## Clinical Lecture

ON

## FEIGNED "ERYTHEMA GANGRÆNOSUM."

(A CASE OF MALINGERING.)

*Delivered at University College Hospital,*

By TILBURY FOX, M.D., F.R.C.P.,

Physician to the Department for Skin Diseases.

GENTLEMEN,—From time immemorial diseases of various kinds have been simulated amongst all classes of society. As has been well said, "the monarch, the statesman, the priest, the soldier, and the criminal have alike feigned mental and bodily infirmities for the advancement of their own ambitious or nefarious designs," whilst others have found, in such deception, the ready means of exciting pity and of securing charity, or extorting claims unfairly. Very many feigners suffer from ill-health, or are the subjects of hysteria or morbid habits, manners, or tastes, and, indeed, are such as one may fairly expect would be likely to be under the influence of the stimulus to morbid actions. In some instances, however—and I shall bring under your notice to-day, as I believe, an instance of the kind,—individuals feign diseases who are *apparently* quite healthy in mind and body, and without there being seemingly any kind of motive or object in their so doing.

There are not many skin diseases which are feigned. Malingerers generally copy the pustular or ulcerative diseases, since these may be readily simulated and kept going at will by the application of local irritants. The case which I wish to speak to you about now was one in which a number of semi-gangrenous spots were developed in different parts of the body, and which, I doubt



not, were produced by the patient herself. The disease answers to what has been termed erythema gangrænosum, which I have always regarded with grave suspicion, at least in almost all cases, as a feigned disease. Here are the notes of the case.

*Previous history.*—Patient has been a general servant without interruption since February, 1874. She is single, has lived well, and is well clothed. She has been in one situation only since she went out to service; the house is dry and very open. Has lived in London or its suburbs all her life. She is short for her age, and rather stout, of lively disposition, pale and sallow complexion. She has four brothers and one sister all healthy. Has had good health, is well nourished, and strong. Last December had dropsy, which lasted about a month. Has never had rheumatism or scarlet fever.

*Present illness.*—On Thursday, August 20th, she first noticed a long red patch on the front of the lower part of her left leg, about three inches long and an inch wide. This itched a great deal both day and night. On Friday, the 21st, she found a scab formed over the outer part of the patch, leaving a narrow red rim round it. A short time after the appearance of this first patch, five others were seen, one on the left cheek, a second on the back of the left hand, a third on the outer side of the right thigh at the junction of the lower and middle thirds, a fourth on the back of the left forearm about two inches below the elbow, and a fifth to the inner side of the first patch on the left leg over the tibia, and to its inner side, about the lower part of the middle third of the leg. All the patches formed on the same day. The chief patch is over the left mamma; this first showed itself towards the evening of the 20th as a scarlet patch about 4 in. by 4 in., the lower border being about an inch and a half above the nipple, the outer border reaching the anterior margin of the axillary fold, the inner border being about half an inch outside the left margin of the sternum. On the 21st (Friday), on waking, she found that the patch on the breast had become broken up into irregular patches of white, dead-looking skin, surrounded by a reddish halo. Over the parts of the patch which did not become red a slight, thin, brownish-yellow crust formed, as of eczema. About eleven of the white patches have formed altogether on the breast. Since then patient has not noticed any material change in appearance. On the 21st she discovered that the white patches were anæsthetic.

On the 25th of August the patient presented herself at the out-patient department, with a condition of skin as already described. The health is good; patient does not complain of pain, discomfort, or malaise. Menstruating at the present time; began to-day. Over the left mamma, extending over the area just described, is a mottled irregular patch of redness, consisting of many (five or six) isolated patches of various sizes. In each of the smaller patches are one or more depressed dead-white areas, surrounded by a red halo, the intensity of redness being greatest at the edge of the white patches, and fading abruptly at the periphery into the healthy skin. The breadth of the halo varies in different parts; in some cases it is not more than about one line, while at other parts it is two, three, or more lines. The redness of the halo fades a little on pressure, but does not disappear. In some parts there is a wider extent of redness than above described, where the skin is covered

with a brownish-yellow crust, as is seen in ordinary eczema or in the later stages of herpes.

The depressed white patches are anæsthetic. The patient can feel, when pinched, to the extreme inner margin of the halo, but loses all sensation immediately the white patches are touched. The white patches feel decidedly colder than the healthy skin. Temperature taken and found to be higher than in other parts. Even over the areas of redness minute white anæsthetic spots may be detected, the size of some of the spots being not larger than millet-seed. In all the parts of the skin that are not white the patient has sensation, although even in the red parts the feeling is perceptibly diminished as compared with the adjacent healthy skin. All the other patches of the body furnish similar results.

It may be observed that all the affected parts lie on the left side of the body except the patch at the lower and outer part of the right thigh, the parts affected being the left mamma, left forearm, left hand (back), and left leg and slightly the left cheek, and, as just said, the lower and outer part of the right thigh. The patch on the right thigh is general, diffused, about  $3\frac{1}{2}$  in. in its largest (horizontal) measurement, and about 2 in. in the vertical measurement, the anæsthetic patch within this being  $1\frac{1}{2}$  in. horizontally and  $1\frac{1}{2}$  in. in its greatest vertical direction. On the front of the left leg are three streaky patches, the innermost one being about  $1\frac{1}{2}$  in. long and  $\frac{1}{2}$  in. broad, and situated at the lower part of the middle third of the leg, just behind the inner edge of the tibia; this runs obliquely downwards, inwards, and backwards. Side by side with it is another patch about an inch long, and varying from a line to 1-5 in. in width. Nearly the whole of the skin on these patches is white and anæsthetic, there being only a narrow red halo, about a line in length, round them. The remaining patch in this situation is six inches long, but is not quite continuous, there being a break of half an inch at the lower part of the middle third; its width is half an inch above the break, one-eighth of an inch below. The lower portion runs obliquely outwards, downwards, and backwards, in the direction of the external malleolus; the upper portion is vertical, and on the inner side is an irregular portion of white anæsthetic skin extending at the upper and lower ends more than half-way across the patch, in the middle for about one-third of the distance; on the outer side there is a streak a quarter of an inch wide, which is partially anæsthetic, but is of a mottled appearance; between them there is a portion of skin which is red, but which retains its sensibility. The lower segment of this patch below the break is white and anæsthetic, surrounded by a red halo a line in width. The general appearance of these patches, taken collectively, gives the idea of some strong corrosive liquid having run down the front of the leg and caused the skin to lose its vitality. On the back of the hand is a circular diffused patch three-quarters of an inch in diameter, the white anæsthetic portion within this being about the size of a large pea. On the back of the arm there is also a circular diffused patch an inch in diameter, the skin within this being dark red, but more or less anæsthetic. On the cheek there are a few irregular spots, which are anæsthetic; they are surrounded by a narrow red halo, which is not so distinct as round the other patches. The portions of skin which were yesterday of a dull

pearly whiteness, have to-day assumed a greenish tint. Temperature of white skin taken on the largest patch on the mamma 94°4'; healthy skin, 92°8'.

Aug. 27th.—The patches have not altered much in character, except that the yellowish scabs on the left mamma are thicker. Patient slept well. Bowels open. Takes her food well. General temperature 98°6'; temperature of white patch on left mamma 94°2'; of healthy skin of right mamma, 92°. Heart examined and found normal. Urine acid, 1020, no albumen, no sugar. The patches are now of yellowish tinge, and not dead white, as when first seen. The patient states that the skin surrounding the patches is painful, and that it has always been so. Some simple ointment has been applied to the patch on the right thigh, and the patient says now that she feels over the part when touched. This part is now covered with a dark honey-colored crust. Over some of the patches the cuticle is beginning to loosen. Repeat yellow mixture and simple ointment. Patient states that she already feels better after a few doses of the mixture, though she did not complain before of feeling ill in the least. A question as to this point was put on admittance.

29th.—On Thursday, the 27th, there being reason to doubt the truth of the patient's statements with regard to the loss of sensibility of the white patches, the patches on the front of her left leg, being obscured from her view, were touched four times in succession with the point of a steel pen on the same spot. Twice she said she felt, and twice she said she did not. This afternoon Mr. Tweedy tried the patch on the breast with a pair of sharp-pointed scissors, sometimes using one point, sometimes two. It was then found that when she could not see the part she made guesses at random, sometimes saying she could feel, and at others that she could not, though the same spot was touched in each instance.

Sept. 1st.—The cuticle forming the white patches on the front of the left leg which has been treated with spermaceti ointment has been shed, leaving deep sharp-cut ulcers, surrounded by slightly raised, red, inflamed margins. There is no material alteration in the patch on the left breast beyond a thickening of the yellow honey-like scabs. There is also a thickening of the scabs of the patch on the right thigh. The other patches appear to be dying away. The scabs on the left hand and forearm, and also on the cuticle forming the white patches in those situations, have come away, leaving in the place of the former a red blush, of the latter white cicatrices.

5th.—The white patch of cuticle on the left breast is evidently much thickened and hardened, and there is some amount of serum effused beneath it. The scabs are still thickening. Ordered quinine and iron three times a day.

8th.—The scabs on the breast have been shed, leaving a red blush. The large patch of white skin is still *in situ*, and has not changed its appearance.

10th.—The patch of white cuticle on the breast was yesterday rubbed off by the patient's dress, leaving a weeping surface of true skin, which has this morning scabbed over. The ulcers on the left leg are in much the same condition as on the 29th ult. They have been treated with opium and lead liniment since the 26th.

15th.—The scabs have all come away, leaving a

red blush. The ulcers on the left leg are slowly healing up. To be dressed with red-wash.

23rd.—There is a red mottled appearance of the skin in the situation of all the sores, except those on the left leg, the ulcers of which are healing more rapidly. Patient discharged this afternoon.

Now, gentlemen, I will give you the reasons which induced Mr. Tweedy and myself to come to the conclusion that this was a case of self-induced disease, and not one of erythema gangrænosum.

In the first place, there was no evidence of any disturbance of the general health, such as would explain the local lesions. The girl at the date of the attack of eruption was apparently in excellent health; she had never been subjected to any deprivation or been placed under any insanitary influences such as might have induced a cachectic or morbid state of body. It is impossible to suppose that gangrenous spots could spring up idiopathically and extensively over the surface unless there were very serious disturbance of the nutrition of the body to account for it. In cases of undoubted erythema gangrænosum of the skin the patients have been rather moribund than anything else; the nutrition of the body has been profoundly altered, and the mischief in the skin has constituted only one of a series of phenomena, indicative thereof. For instance, in certain paralytic cases, when death has not been far off, in cases of ossified arteries, in the instance of severe purpura, erythema followed by gangrene has been observed. But in the case I bring under your notice there was not to be found a jot or tittle of evidence of ill-health or malnutrition. It is true the girl had what she termed "droopy" a few months before, but it is difficult to say what she meant by this term; it may have been swelling of the legs from anæmia; but, at all events, for some time before, and at the time of the attack of the disease in the skin, the girl was in good health, and erythema gangrænosum does not occur under these circumstances.

Secondly. The onset and course of the disease were not those of a gangrenous disease, but just those of severe blistering. The patches began by active hyperæmia, assumed the aspect of a vesicated surface, and not the livid sphacelated aspect of a gangrene, whilst a healthy reparative process was speedily set up in them. As before observed, patches of erythema gangrænosum often begin as purpuric or livid spots, and certainly not by active hyperæmia, which in the present instance was more like that induced by a local irritant, as was also the vesication, or what appeared to be gangrene; whilst the speedy advent of active repair indicated that the nutrition of the body was good. As soon as the patient came into the hospital and had no further chance of practising deception, fresh supposed gangrenous patches ceased to appear, and the whole of the diseased spots began to take on the healing process, which proceeded at a rapid rate. It was, indeed, the general aspect of the pathological changes, especially the exact similarity of the changes to those which occur in a severe vesication in a healthy subject (the whitened centre and the red halo around), which led us at once to suspect malingering; because it seemed to us clear that, if the disease were an idiopathic one, a state of nutrition which could induce so profound a change in the tissues as gangrene was altogether antagonistic to the occurrence of the most active reparative process. The fact of the existence of the latter, indeed, gave the lie to that of

the former. The changes in the patches ran the course of those of healthy wounds, and hence the disease could hardly be idiopathic gangrene.

Thirdly. The distribution of the patches was very peculiar. They were all but one on the left side, and exactly in the sites most accessible to the right hand—viz., over the mamma, the cheek, back of the hand, back of the forearm, and over the front of the tibia. The patch on the right thigh was at its lower and outer part, or the place most conveniently reached by the hand. There was nothing in the shape of the patches to call for much notice, save that the patches on the left leg were long and narrow, the long axis of the patch corresponding to that of the limb itself; and, as stated in the notes, their appearance collectively gave the idea that some strong corrosive liquid had been allowed to trickle down the leg, and to have been diverted laterally on either side below, as would indeed occur if fluid of a certain character were allowed to flow down the front of the leg. The non-symmetrical distribution of the disease, its presence in the parts of the body most accessible to the hand, and the appearance of the streaky patches on the left leg, point to a simulated and not a real disease.

Fourthly. The statements of the patient with reference to anæsthesia conclusively showed that, at least, the patient knowingly deceived us in regard to certain features of the cases. You will remember the notes stated that at first it seemed to be certain that the white areas of the diseased patches were anæsthetic; but on further testing this point, whilst the patient's view was obscured, her statements were found to be contradictory and untrustworthy. This, of course, must be regarded as very strongly confirmative of my view of the case.

Fifthly. The effect of pseudo-physic in this case confirms me in the view I take of it. The patient was ordered some yellow mixture, and told she would have some medicine, whilst the wounds were dressed with the simplest unguent. After some few doses of the sugar-and-water, she expressed herself as feeling already very much better, the fact being that she had never complained of feeling in any way ill or unwell before, though she was expressly interrogated upon this point on admission, and subsequently. She, in fact, assumed that she was and had been ill, and was better after taking the medicine, whilst she had before expressly stated that she was quite well. This seemed again to point to deception, the patient having forgotten to act up to the rôle assumed on former occasions.

I do not enter into any other considerations. I think the above quite sufficient, and especially the pathological aspect, to show that the case could not have been one of idiopathic erythema gangrænosum, but a self-induced one. The difficulty of discovering any motive for the feigning of gangrene does not alter the matter at all.

If you ask me what irritant did the girl use, I answer candidly that I do not know. It is not unlikely that it may have been hydrochloric acid, which has been used to produce "white gangrene" of the skin.

I beg of you to be very cautious in dealing with instances of so-called erythema gangrænosum of the skin, especially in hysterical subjects. Why individuals should take a fancy into their heads to produce vesicated patches of disease here and there

about their body may be difficult or impossible to determine, yet that they do so cannot be doubted; but whenever you observe a case of the kind, you will know it is not one of idiopathic erythema gangrænosum if it occurs in a healthy subject, is accompanied at its outset by active hyperæmia, by an absence of purpuric symptoms, and if the patches speedily undergo repair. In other words, a gangrenous condition is incompatible with the phenomena of acute inflammation and rapid repair; at least, this is my experience.

One word before concluding touching the moral treatment of the case. When you have detected a case of malingering, do not be too hasty to deal harshly with the patient. There may be some morbid state of mind in him or her, unappreciable to the ken of the physician, which impels the malingerer to his feigning. Therefore be tardy in treating him or her as a wilful misbehavior; the duty of the physician is to be kind under all circumstances, and never cruel.

## Original Papers.

### NOTES OF SIXTEEN CASES OF ABORTION.

By JOHN DOUGALL, M.D. Glasgow.

THE abridged particulars of the following cases are submitted, not to illustrate any novelty in treatment, but from their variety and clinical interest.

CASE 1.—Mrs. D—, aged thirty-six, in fifth month, second abortion, fifth pregnancy, got a kick on the abdomen from her boy in bed. Two days after had slight oozing of blood from vagina, with pelvic and lumbar pains. On third day both increased. Os uteri was somewhat open, and the fetal limbs could be felt. Cold was applied to the vulva, and ergot with digitalis prescribed. About four hours after the fetus was expelled. Ergot was again given to assist the expulsion of the placenta, but after two hours, during which the hæmorrhage was trifling, the os was found nearly closed and the cord running into it. Matters remained thus for three days; ergot had no effect. The hæmorrhage, though slight, was constant. I insisted on giving chloroform and exploring the uterus, but she objected. Latterly she was anæsthetised with difficulty. The hand was passed into the vagina, as recommended by Dr. Barnes,\* and the finger swept round the uterine cavity, when the placenta was found free from attachment, and removed with ease. Made a rapid recovery.

CASE 2.—Mrs. W—, aged twenty-five, in fourth month, first abortion, second pregnancy, began to lose blood without apparent cause. Opium and horizontal rest were prescribed with temporary success. On the third day after, hæmorrhage returned greatly increased, with severe bearing-down pains. I was told "all was away," and found the fetus lying among a mass of coagula. I searched in vain for the placenta. The os admitted the point of the finger, but the uterus was

\* Obstet. Oper., p. 397, second edition.

too high to be explored satisfactorily. I took the usual precaution to abate hæmorrhage, and administered ergot repeatedly. In twenty-four hours expulsive action was evoked, accompanied several times in the intervals with a gush of blood. Feeling the placenta dilating the os, and having tried in vain to liberate it with the fingers and ovum forceps, I introduced my left hand into the vagina with comparative ease, and steadying the uterus above the pubes with the right, insinuated two fingers between the placenta and uterine wall, and instantly brought away the mass entire. She made a good recovery.

CASE 3.—Mrs. McD—, aged twenty-six, in tenth week, first abortion, first pregnancy, six months married, had been doing some extra cleaning, and was attacked with slight hæmorrhage and bearing-down pains. She continued to work till compelled to desist from increase of hæmorrhage and pain. Os closed, cervix remarkably elongated, from which the probability of averting the impending danger was inferred. I prescribed Battley's solution, with digitalis and sulphuric acid, light diet, horizontal posture, abstinence from fermented liquors, and cold to the vulva. On the following morning the ovum was shown me entire, having been expelled during the night. This was rather unexpected, from the condition of the os and cervix the previous evening. Recovery was rapid.

CASE 4.—Mrs. McA—, aged twenty-five, in tenth week, first abortion, first pregnancy, four months married, when assisting in hanging pictures, was suddenly seized with severe pain and hæmorrhage. Four hours after I found the ovum unruptured lying in the vessel. Patient was extremely sorry at her mishap, having a strong desire for offspring. She was kept in bed ten days and carefully nursed. She convalesced rapidly. After twelve months she consulted me in regard to her not being again pregnant. Is healthy, menstruating easily and regularly, but complains of dull pain over right ovarian region. The os is healthy, but pointing abnormally backwards and to the right. After repeated attempts I managed to introduce the sound. The uterus was flexed diagonally, its fundus lying in the left sacro-iliac synchondrosis. On the least rotation of the sound unbearable pain was produced. Subsequently I made several similar trials with the same result. It is three years since she aborted, and, though healthy, has not again conceived.

CASE 5.—Mrs. A—, aged twenty-eight, in fourth month, first abortion, third pregnancy, without apparent reason had an oozing of blood for five days, when it greatly increased, accompanied with violent bearing-down pains. I found her very weak. She said it was a miscarriage, and handed me a fœtus about one inch long wrapt in a bit of newspaper. I examined the clots, soiled cloths, &c., for the secundines without finding them. The os was almost closed, and nothing protruding from it. I prescribed ergot, digitalis, and sulphuric acid, rest, low diet, &c., and left her comfortable. Next day she felt perfectly well; a vaginal examination showed only a slight sanguineous discharge and tumidity of the labia uteri. On the second day she was in the same condition: no pain, resting quietly. In the afternoon I was hurriedly summoned, as she had suddenly flooded. Os still closed. Having stanchd the hæmorrhage by stuffing the vagina with sponge wet with vinegar, as recommended by Dr. Dewees,

and taken other precautions to prevent bleeding, I left. Two hours after she had lost no more blood, but was extremely weak, with a dicrotic pulse, and a presentiment that she was about to die, "as she once had a sister who died from the same symptoms." Suddenly she felt as if the bowels would move, but could not. I withdrew the sponge, gave a large simple enema, and retired to the adjoining room. In about five minutes I was called, and found the placenta expelled entire with the enema, but no fœcal matter. Recovery was rapid.

CASE 6.—Mrs. P—, aged twenty-four, in third month, first abortion, first pregnancy, six months married, had been losing blood for two days, accompanied with severe pain. I was shown "something that had come away"—part of the fetal involucre. I prescribed rest, ergot, sulphuric acid, and digitalis. The hæmorrhage was trifling. Next day she had a slight attack of metritis, the lochia becoming fetid, which was allayed by opium, poultices over the abdomen, with vaginal injections of an aqueous solution of hydrochloric acid. On the whole, recovery was tedious. Three months after she began to menstruate, having missed the previous term. Had no pain, but felt sick; os closed; bleeding trifling. She was kept in the horizontal posture, and laudanum, digitalis, and sulphuric acid given. The hæmorrhage ceased in two days, and she was going about in a week. Two months after she lost about six ounces of blood per vaginam. It began while using a light wooden rake in a garden plot. There was no pain nor sickness. The last mixture was again prescribed, and the utmost quietness enjoined. In four days the hæmorrhage ceased; in two weeks she was going about. Latterly has had a living mature male child; breech presentation.

CASE 7.—Mrs. D—, aged thirty-two, in fifth month, second abortion, fifth pregnancy; attributed her mishap to prolonged grief. I found her nearly pulseless from loss of blood, while a male fœtus about twelve inches long, with the cord and placenta attached, lay among the hæmorrhage. Still bleeding profusely, cold was applied to the vulva and abdomen, the vagina stuffed with sponge soaked in a weak solution of perchloride of iron, and brandy with ergot given. As the bleeding resisted the usual means of arrestment, she was put under chloroform on the third day, and the uterus explored. The os was open and patulous, but except one or two small clots, nothing was found in its cavity. Next day, the napkins being still largely stained with florid blood, I introduced an elastic catheter, with the opening at its point, into the uterus, and injected about half an ounce of aqueous solution of iron alum (strength two scruples to the ounce), which had the desired effect. In two days the injection had to be repeated, after which the bleeding gradually stopped. I had ceased attending for a week when she took a sudden flooding after washing her feet in hot water. The same means were employed as hitherto, and were attended with the same difficulty. After a course of iron and quinine she eventually recovered.

CASE 8.—Mrs. A—, aged twenty-eight, very æmemic. Eleven weeks previous to my visit had a mole abortion at third month. Had a living child that first year of her married life; had three consecutive abortions since, of which the mole was the last. This was preceded by much hæmor-

rhage, and at the time of visit (eleven weeks after) it had not ceased. The uterus was found somewhat retroflexed, and measuring three inches and a half, the os open, and its labia tumid. The uterine malposition was comparatively easily adjusted, though causing some pain. The organ apparently contained no shreds of membrane nor clots, nor was the discharge fetid. She was advised to keep her bed, use cold astringent injections, take chiefly albuminous diet, also milk, wine, steel, and quinine. In about three days the bleeding completely ceased, and in a fortnight she was fairly convalescent.

Twelve months after she again became pregnant, of which I was duly apprised, and reiterated my advice to avoid physical and mental excitement. She obtained my consent to reside a short time at the coast. A few weeks after she had to hurry to reach the boat. On arriving home she had slight hæmorrhage, shivering, felt sickly, also bearing-down pains, with backache. I found the os closed, but feared, from her abortive diathesis, another miscarriage. Stimulants were prohibited, a light diet ordered, with rest and quietness in the horizontal posture, and solution of opium with digitalis prescribed. This treatment seemed successful, and in a week I ceased visiting. In two days I was called, when the ovum entire was shown me. It contained a three months' embryo. Recovery was rapid, after which she resided some weeks at the seaside, having salt water baths daily, and taking compound syrup of phosphate of iron, with a regular allowance of light dry sherry.

In five months she was again pregnant. Being extremely anxious for offspring, and remembering previous experience, she put herself entirely under my care, and ultimately had a daughter at full term. Previous to her confinement there was much œdema of the lower limbs, slight swelling of the features, and considerable albuminuria. These gradually disappeared under appropriate treatment after parturition. She made a good recovery, and is now in better health than for some years. The child, aged twelve months, is well. She is again five months pregnant.

CASE 9.—Mrs. J.—, aged twenty-two, in third month, first abortion, first pregnancy, married four months. Two days before had been polishing a friend's table, the obvious cause of her illness. I found her much depressed and vomiting. There was little bleeding, but severe and frequent bearing-down pains. The ovum was projecting through the os. A dose of ergot was given. After an hour, no change taking place in her condition, I left. On my return in six hours I was shown the ovum entire, newly cast off. The hæmorrhage was trifling. Three days subsequently she had a slight attack of metritis, which yielded to subchloride of mercury and compound ipecacuanha powder, with hot applications to the abdomen, and washing out the vagina with water acidulated with HCl; otherwise she made a good recovery.

CASE 10.—Mrs. M'C.—, aged twenty-eight, in the fifth month, first abortion, fourth pregnancy. When in her fourth month she had an oozing of blood from the vagina, with bearing-down pains—the apparent result of a long walk. She was kept in bed a week, and sedatives administered successfully. Soon after she had severe acute bronchitis, causing prolonged paroxysms of coughing, for which she was kept in bed two weeks. When

scarcely recovered, an only child had inflammatory diarrhœa, causing her much anxiety and extra trouble. After he got well she set to a day's cleaning, in direct opposition to my emphatic instructions and also those of her husband. The same night uterine contractions began. I found little hæmorrhage; the funis prolapsed and pulseless. The presentation was footling; the lower half of the foetal body lay in the vagina; the upper was grasped by the uterus. Traction on the limbs with two fingers failed to disengage it. Ergot with borax had no effect. During the next twelve hours I saw her several times. Latterly the fœtus was expelled. A large dose of ergot was given to assist in the expulsion of the placenta; the effect was again *nil*. On tracking the cord in the vagina, it was found entering the os, which only admitted the point of the finger. Causing an attendant to grasp the uterus over the pubes, I made slight traction on the cord with the right hand, and endeavored with my left to dilate the os and otherwise assist in extracting the placenta; but the cord parted within the uterus. I tried to pass the hand into the vagina, but failed. There being still little bleeding, I resolved to wait and see what nature would do. Nature took matters easy. For two days she fed well, slept soundly, and was painless; but I was getting anxious. Chloroform was given, and with the left hand in the vagina and the right steadying the uterus over the pubes, I dilated the os to the size of a crown-piece, and found the placenta adhering to the left uterine wall and part of the fundus. The most extreme difficulty was experienced in getting it separated, the two fingers not being able to work at the fundus, nor the hand to enter the uterus; consequently, about two-thirds of it was extracted in small shreds. Latterly the adhesion was separated, and a good hold obtained of the remaining large part, which was liberated coincident with a uterine spasm. Five hours after the patient was flushed, and complained of headache; pulse 108. Next day the pulse was 72; headache gone. She recovered rapidly without a bad symptom.

CASE 11.—Mrs. C.—, aged twenty, in third month, first abortion, second pregnancy, after walking about seven miles, had bearing-down pains with profuse flooding. I found her supported by two persons and unable to move. She was put to bed, and as the pain was unusually severe, thirty minims of sedative solution of opium were given. The os admitted the finger, and the foetal ovoid was found jammed in the cervix. A towel soaked in cold water was applied to the vulva, the pelvis raised, and the shoulders lowered. This lessened the hæmorrhage, while the opium soothed the pain. About three hours after her bowels inclined to move, she insisted on getting up, and fainted. On my arrival she was recovering, but blanched and nearly pulseless. Brandy had just been given, by which, with the horizontal posture, she revived. The membranes were now protruding, the hæmorrhage had ceased, and the pain was nearly gone. After waiting about an hour, and her condition remaining the same, ergot with borax was given, and, assisted by the two fingers grasping the membrane, resulted in the expulsion of the ovum entire. Patient made a fair recovery, and was pregnant four months after.

CASE 12.—Mrs. E.—, aged twenty-four, in third month, second abortion, second pregnancy, on a journey from London to Glasgow by railway,

became ill soon after leaving Carlisle, but bore up till her destination was reached. She had lost a deal of blood, the result of which was obvious in her feeble polycrotic pulse, exsanguine lips, and anæmic features. An ounce of brandy was at once given, the shoulders lowered, and the pelvis raised. The os was slightly open, and what seemed a portion of ruptured ovum involucre hanging from it. As she was still bleeding, the vagina was stuffed with sponge wet with a solution of tincture of perchloride of iron, and warmth applied to the feet. She began to revive, but being too weak to bear any attempts at extracting the foetal structures, I resolved to wait, and ordered beef-tea and wine with chicken broth and arrow-root. Next day she was much better; and had slept a few hours, though wakened several times by uterine pains. On withdrawing the plug it was followed by several large clots and fresh hæmorrhage. A cold astringent lotion was injected. The os was somewhat open, but no projecting body felt. The plug was again used successfully, and the extruded coagula were carefully searched, yet no traces of embryo or membranes were seen. That night the plug was once more removed, but had to be replaced. Next day I proposed to give chloroform and explore the uterus, but patient and husband objected. Ergot, strychnia, and steel were prescribed, and for nearly a week the treatment was merely a repetition of the foregoing. Latterly the hæmorrhage so far lessened that the plug could be dispensed with. Astringent injections were continued for some days, when the discharge gradually assumed a lochial character, and ultimately ceased. Convalescence was protracted. She was in fair health and menstruating six months after.

CASE 13.—Mrs. F——, aged thirty-two, in third month, first abortion, second pregnancy. I found her in a most perilous state from loss of blood, her features sunk and blanched, her extremities cold and pulseless; in fact, *in articulo mortis*. The vessel contained about half a gallon of blood, while a great portion of her bed and body clothes were saturated with it. As there were no stimulants in the house, I had to wait till some were procured. In the interval the pillows were removed from under her head and placed beneath the pelvis, and cold applied to the vulva and pubes. A friend having returned with half a tumblerful of whisky, she was at once made to swallow about three-fourths of it, while heat and friction were applied to the extremities. Either from nearly absolute depletion, or from general vascular contraction caused by the muffled and weakly flicker of the heart, or more likely from both, the hæmorrhage had spontaneously ceased before my arrival, or was easily arrested by the means stated. In a short time the radial and temporal pulses could be detected—quivering threads, and she answered one or two questions in monosyllables. A mixture of egg and brandy was now given in small and frequent doses, and in an hour after she was much improved; pulse 160. A vaginal examination now made showed the os uteri much dilated, and a round body protruding, which I slightly tried to extract, but failed. Next morning she was further improved. I liberated the body from the os, which proved to be a large black coagulum. For some days she was carefully fed and nursed. There was no more hæmorrhage, and, being na-

turally healthy and muscular, she made a rapid and uninterrupted recovery. No portion of the ovum was found.

CASE 14.—Mrs. T——, aged twenty-eight, in seventh month, third abortion, third pregnancy. Is tall and heavy, but lax of fibre, anæmic, and weak. The night previous she had been doing some extra housework, though suffering from diarrhœa. I found her in bed, with the body of a dead female foetus protruding from the vagina. The liberation of the head was only wanted to complete the birth, and was easily done, previous to which I gave ergot and borax in cinnamon water. The placenta came away easily, followed by considerable hæmorrhage. She progressed favorably till the thirteenth day, when pain commenced in the right inguinal region, with increased swelling and stiffness of the corresponding leg (her limbs were anasarcaous previously), thirst, and headache—symptoms indicative of phlegmasia dolens. She was kept in the horizontal posture, with the affected limb raised, four leeches were applied to the most painful part, hot fomentations, liniments, and dry friction used, milk, wine, raw infusion of muscle, and chicken soup ordered, and a mixture of steel and strychnia prescribed. Under this treatment she improved, and was out of bed in three weeks. She then stayed two months in Arran. At present (eight months after her confinement) the limb is still much swollen. She complains of a dull and constant pain in the knee-joint, while her general health is obviously impaired.

CASE 15th.—Mrs. C——, aged twenty-six, in third month, first abortion, first pregnancy, married two years and a half, first consulted me in regard to general debility and leucorrhœa. She was much improved by a course of tonics and vaginal injections. Soon after she had a large vulval abscess, which discharged copiously and reduced her health considerably. She then had fistula in ano, and was operated on. After this she was put on steel and cod-liver oil, by which she laid on flesh very rapidly. I then advised her to stop the oil and continue to take ten minims of tincture of perchloride of iron thrice daily. About eight weeks afterwards she called to say she had missed two of her monthly periods. In less than a week I was requested to see her. She had been losing a little blood for two days, and had now bearing-down pains. "She was sure it was not because she had not taken the steel drops, as she had not missed a single dose." Though I had an idea that the iron might have contributed to causing her pregnancy, I now thought that her taking it after might be the cause of her aborting. The os was slightly open, but no ovum could be felt. Opium, digitalis, and sulphuric acid were prescribed, with light diet, the horizontal posture, and quietness. This treatment seemed successful, but next day the pain and bleeding returned, and the bag of membranes was felt dilating the os. Ergot was given, and, after four hours' severe suffering, the ovum was shed entire. She made a good recovery. The fistula was unhealed four months afterwards.

CASE 16.—Mrs. B——, aged thirty, in fifth month, first abortion, fifth pregnancy. The previous evening she fell from a chair while adjusting some clothes on a rope. I found her on the verge of syncope from loss of blood and in great pain. On examination the membranes were found entire

and beginning to part the labia pudendi. They were at once ruptured, as recommended by Prezoa,\* and almost immediately the fœtus was expelled by the breech. Ergot was given, and in five minutes the placenta was easily removed, hæmorrhage and pain quickly ceasing. Patient was up in a week.

**Remarks.**—Some points in these cases are common to all such, as the period when abortion took place, its cause, chief symptoms, &c. But there are, others, illustrating certain doctrines in regard to abortion generally, to which the following remarks apply.

1. The removal of a retained ovum or placenta is effected in three ways: (a) by the giving of substances which stimulate the uterus to contract; (b) by the avulsion of the ovum or placenta with forceps, &c.; (c) by passing the hand into the vagina and the fingers into the uterus and turning out its contents. (a) Cases 1, 2, 5, 6, 7, 9, 10, 11 show that, whatever effect ergot or borax had in lessening hæmorrhage, they had little if any in causing uterine contractions. (b) The use of the ovum forceps, wire crotchet, &c., for dragging away the ovum or placenta is generally and justly condemned from the obvious risk of wounding the uterus. Only in Case 2 was the ovum forceps used and without benefit. (c) Cases 1, 2, 10 show that the placenta may be retained a considerable time without danger, also the success attending its removal by the hand in the vagina. In Case 10, where the placenta was adherent, and uterine stimulants failed, obviously no other procedure could have resulted nearly so satisfactorily.

2. There is a strong presumption that the cause of abortion in Case 4 was uterine flexion and adhesion prior to pregnancy. Madame Boivin found, in the course of her dissections, that in many of those women who always aborted when they arrived at a particular period of pregnancy, the uterus had contracted adhesions with the neighboring viscera and the general pelvic cavity.†

3. Plugging the vagina with sponge wetted with some astringent fluid was done nearly a dozen times with unvarying success, the speculum being used in most cases. While admiring the scientific manner of plugging with tangle, recommended by Dr. Barnes, I have found it comparatively difficult to perform; besides, it is necessary, so as to be sure the plug will keep *in situ*, to stuff the vagina with a portion of sponge, lint, or some such body, which of itself might be sufficient to prevent hæmorrhage. If this be omitted, it may be found that the tangle is expelled as soon as it begins to expand the os, from the uterine contractions thereby originated.

4. In Case 5 the action of the enema in stimulating uterine contractions was very marked and successful. This plan is well worthy of further trial in cases of retained secundines with hæmorrhage, in conjunction with other means usually employed.

5. Vaginal injections of hydrochloric acid, where the lochia seemed at all fetid, were often used. The mineral acids, being reliable disinfectants in small quantity, as distinguished from mere deodorants, should be used in all such cases.

6. In six of the cases it was attempted, without success, to save the ovum. The twice-recurring threatened abortion in the pregnancy succeeding abortion, in Case 6, shows, however, that even where miscarriage is imminent (provided there is

reason to believe the ovum or fœtus is living) the means to abort it should be employed.

7. I am not aware of any recorded instance of the injection of iron alum into the uterus. The astringency of this salt is very great; and in Case 6, where it was frequently used, the effect was highly satisfactory. I find the uterus is more tolerant of internal medication than is generally believed; and in cases of chronic endometritis I have frequently injected solutions of iodine and chromic acid, and also have often introduced pure carbolic acid with the probe invented by Professor Playfair.

8. The bracing effects of the atmosphere of certain places on the west coast of Scotland are well known. I have several times been struck with its curative influence on functional diseases of the female sexual organs, and have had at least four cases where some weeks' residence at the coast, along with other appropriate treatment, was soon followed by pregnancy after prolonged sterility. Whatever favorable effect the compound syrup of phosphate of iron may have had in Case 8, the woman herself is convinced that she owes, in great part, her improved health and living child to a lengthened stay at one of the Clyde watering-places.

9. Case 14 is typical of a class not uncommon, where nature, in a cachectic habit, with its usual malign concomitants, makes frequent abortive attempts at reproduction. In such cases utero-gestation is often, in the same patient, brought to the verge of completion, when, from some cause, foetal or maternal, not easily eliminated and difficult to avert, the vital process is suddenly blighted, and a premature still-birth results. The phlegmasia dolens which followed in this case could not arise from the usual cause, great hæmorrhage, as that was only considerable.

10. Whether the continued administration of iron during pregnancy in Case 15 helped to cause the abortion is questionable, but I have thought proper to record the circumstance. At a meeting of the London Obstetrical Society. Dr. Barnes alluded to an instance where a pupil of his had given iron to a pregnant woman, and was in consequence accused of intending to produce abortion. Dr. Barnes said he had given it in dozens of cases, and never witnessed any ill consequences, or instances in which abortion could be traced to its administration. He thought iron might safely be given where anæmia was present during pregnancy, to improve the patient's condition and lessen the risk of hæmorrhage during parturition.

11. The quantity of blood women lose in abortion and parturition is often very great, yet it is astonishing how quickly they generally recover. Cases 7, 12, 13, and 16 are marked examples. In view of this, probably bleeding might be had recourse to with benefit more frequently in acute diseases. The admirable address of Sir James Paget, chiefly on bleeding, at the Norwich meeting of the British Medical Association confirms the above. Amongst other things, he said: "At the present day we undoubtedly overvalue the blood, and estimate too cautiously the loss of it. The loss of blood to fainting is absolutely harmless." These remarks applied to healthy persons.

Glasgow.

\* Rigby's Midwifery, p. 95.

† Ramsbotham: Obstet. Med. and Surg., p. 653.



## ON A CASE OF

## CONVULSION FROM BRAIN INJURY.

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THE investigation of convulsive seizures may throw light either on the relation of a given alteration in the brain to certain movements, and therefore on the localisation of function in the brain, or upon the laws which govern convulsive seizures considered apart from the special change which causes them. It is impossible to watch the course of many convulsions without being struck with their conformity to (and correlated divergence from) certain regular types. It cannot be doubted that the changes in the nerve centre of which the convulsion is the outward sign, possess certain common features in different cases apart from the locality of their cause. To these Dr. Hughlings Jackson has called frequent attention. The case described below throws little light on the localisation of function in the brain; for, although there was defined laceration, the whole of one hemisphere was exposed to pressure from effused blood. But the opportunity which it afforded of observing the exact characters and course of the convulsive movements, during a long series of fits, was such as to render it possible to ascertain with considerable minuteness the details of many attacks, and on this account it is described.

It will be convenient to give first an outline of the case, and afterwards to describe the details of the convulsive seizures.

A man, apparently about fifty years of age, was admitted into University College Hospital Nov. 30th, 1874, under the care of Mr. Erichsen, whom I have to thank for permission to watch the case. The man had fallen down in the street and had been picked up unconscious. When brought to the hospital he had partly recovered consciousness. He seemed to understand questions, but his answers were unintelligible. He intimated, in reply to questions, that he had pain in the head, but could not point out its locality. Some bleeding from the left ear was noticed, and subsequently some extravasations appeared beneath the left conjunctiva. In this state he lay for six days. On the sixth day convulsive attacks set in, and recurred day after day until his death, six days subsequently. In these attacks, as will be mentioned presently, the right side was affected much more than the left, and after they had lasted for two days there existed distinct right-sided weakness. After the commencement of the fits his mental state became much more dull. The character of his speech was doubtful. Sometimes a few words were uttered indistinctly, but apparently correctly; at other times he used words which were evidently not those which he meant to employ, and he occasionally uttered sounds which were apparently a meaningless repetition of certain syllables. His articulation was confluent—i.e., syllables were run one into another. Swallowing was difficult. His stools and urine were passed into the bed. His urine, towards the last, contained a little albumen, but no sugar. The convulsive attacks were at first very frequent, one occurring every few minutes both day and night; during the last few days they

were less frequent. His temperature, never below 99°, rose, the day after the fits commenced, to 102°, and continued between 100° and 102° until his death. From the first there was rapid loss of flesh. The immediate cause of death was apparently asthenia.

*Post-mortem examination.*—A fracture was found in the left side of the skull, extending from above the occipital protuberance to the external meatus, into which it passed, and thence extended inwards as far as the roof of the tympanum. There was no hæmorrhage between the skull and the dura mater, but beneath the dura mater a thick layer of coagulum lay over the whole left hemisphere. The hemisphere itself appeared rather smaller than the right, and here and there the convolutions had evidently been flattened by the pressure of the clot. All the convolutions were blood-stained. The chief damage to the convolutions was in the temporo-sphenoidal lobe. The outer surface of this lobe in the posterior half was broken up by laceration and effusion of blood over an area of one square inch and a half. The middle convolution was that chiefly damaged. In front of this was a smaller area of laceration, involving the apex of this lobe and part above the apex, and this laceration was separated from the larger injury by an undamaged portion. Some softening existed in the margins of the lacerations. One or two minute lacerations existed in the anterior part of the inferior temporo-sphenoidal convolution. In the orbital lobule were one or two small spots of extravasation beneath the pia mater, and other small spots of laceration at the outer margin of the frontal lobe, about half an inch from the anterior extremity of the inferior frontal convolution. The rest of the convolution was undamaged, and so also was the island of Reil. There was no laceration of the superior middle or ascending frontal convolutions. The damaged convolutions showed, on microscopical examination, the evidences of acute inflammatory changes extending through the entire thickness of the grey matter. Further, adjacent convolutions, which were apparently intact, exhibited much disintegration of the grey layers. The convolutions at a distance from the damaged areas were healthy. Beyond some pneumonia of the lower lobe of the right lung no other disease was found in the body.

*Description of the fits.*—The fits presented, for the most part, considerable uniformity in the course and distribution of the convulsive movement. The part affected varied chiefly according to the severity of the fit; some attacks were slight, others were severe. It will be convenient to describe first the several degrees of what may be termed the typical attacks, and then the way in which some attacks deviated from that type.

In the slightest fits the head alone was affected. In the more severe attacks the head and right arm were involved; in the most severe attacks the head, right arm, and both legs were convulsed. In the slightest fits clonic spasm of the facial muscles alone was observed; in all the others tonic preceded the clonic spasm. There was no pallor at the outset. During the latter part of the severer attacks, in which respiration was interfered with, the face became dusky and congested.

*Aura.*—Most of the attacks were apparently preceded by some sensation about the mouth. There was an uneasy voluntary movement of the lips, and the hand was frequently raised to the



month. Every time this occurred, after a few seconds a fit came on. Occasionally a slight cry preceded the fit, and during the severe fits a peculiar noise was made in the larynx.

**Spasm of muscles of mastication, tongue, and palate.**—In a large number of cases the first spasm occurred in the muscles attached to the lower jaw, and it commenced in these muscles simultaneously on both sides. The masseter and temporal muscles were both involved. The muscles above the hyoid bone, genio-hyo-glossi especially, were affected strongly, while those below the hyoid bone were almost or quite free from spasm. On opening the mouth with a screw gag while the clonic spasm was going on in the muscles of mastication, the tongue was seen to be moved rapidly in the same way. The tip was moved forward a little at each spasm, until at last the tip was thrust between the teeth. The palate was seen working up and down in rapid movement synchronous with the clonic spasm in the tongue and muscles of mastication.

**Spasm in facial muscles.**—After the clonic spasm had lasted for some seconds in the muscles of mastication, twitching began in the face, and usually commenced simultaneously in the right zygomaticus and the right platysma myoides. The right angle of the mouth was drawn outwards, and the platysma stood out conspicuously on the surface of the neck, the left platysma remaining still. Soon after the zygomaticus, the right orbicularis palpebrarum was contracted, and the spasm extended to the triangularis nasi and the levator labii superioris. The left orbicularis palpebrarum was also slightly affected. Both corrugator supercilii muscles were involved, simultaneously and equally.

The head was either straight or directed to the right. The eyes were usually directed to the right, but presented in some fits a curious alternate movement from one side to the other, to be described presently. The pupils during these slighter fits were small throughout. The respiration was not impeded.

**Spasm of right arm.**—In the more severe fits the spasm invaded the right arm soon after affecting the face. It began in the deltoid, and involved the muscles of the upper arm before those of the forearm. Both flexors and extensors were involved. The position of the hand during the spasm was peculiar: the fingers were flexed; the thumb was flexed and bent under the first and middle fingers, so that its tip projected between the middle and ring finger. It continued in this position after the spasm ceased.

The left arm was always free from movement, except that in one or two of the most severe fits it was jerked as a whole by the contraction of the left pectoral muscles.

**Spasm in legs.**—In other, still more severe fits, the convulsion invaded both legs, soon after it commenced in the arm. The two legs were affected simultaneously, the left leg rather more severely than the right. Both were at first rigid in tonic and then jerked in clonic spasm. The right leg, however, was extended at all joints, so that it lay upon the bed; the left leg was slightly flexed at the hip and knee joints, in consequence of which it was raised about a foot from the bed, the thigh being at an angle with the trunk, and the leg parallel to the surface of the bed; it was held in that position.

**Muscles of trunk.**—The sterno-mastoid was in-

volved on the right or left side at different times; the turning of the head was the result of its contraction. The trapezius was involved on the right side; it was not certain whether it contracted on the left side, but it was thought to do so in the severer fits. The pectoralis major was convulsed on the right side in all the fits in which the right arm was involved; that of the left side was still, except for a slight jerking in one or two of the severest fits. The intercostal and abdominal muscles were unaffected in the slight, but were involved in the severer fits, and then were affected together, and those of the two sides equally. The affection of these muscles and the consequent arrest of respiration occurred in all the fits in which both arm and legs were involved; in none of those in which the face alone was affected without the arm; while in the fits in which the face, head, and right arm only were affected, the legs remaining still, the respiration was arrested in the severer, and continued unaffected, or slightly accelerated in the slighter attacks.

The pulse became more frequent during a fit, and irregular towards its close. The pupils were dilated during the latter part of the severe fits.

**Cessation.**—The modes in which the convulsion ceased varied in different attacks. As a rule, the spasm ceased in the limbs some time before it ceased in the muscles of the face, but it occasionally ceased simultaneously in the arm and in the face, and even in the arm, leg, and face. In one severe fit the movement in the arm continued some time after that in the leg and face had ceased.

The average duration of each fit was one minute and three-quarters. The duration of the tonic stage was about one-fourth, that of the clonic stage three-fourths, of the whole duration of the fit.

**Varieties in distribution of the convulsion.**

—In some fits the spasm did not extend to the upper part of the face, but was confined to the muscles of mastication, the right zygomatic muscles, and the right platysma. Some of the fits began distinctly in the right zygomaticus, without any preceding affection of the muscles of mastication. From the zygomatic muscles the spasm spread to the rest of the right half of the face. In these fits the right orbicularis only was involved, the left eye remaining widely open, while the right eye was forcibly closed. The occipito-frontalis muscle on both sides was involved. The eyes were sometimes directed towards the right, the axes being parallel; often, however, the eyes converged, the left eye being directed a little inwards, while the right was in the middle position. The eyes were occasionally jerked, conjugately, in clonic spasm, while clonic spasm was going on elsewhere.

**Alternate movement in the head and eyes.**—

A curious alternation was observable in several fits in the earliest movements. In some, the spasm in the masseters was preceded by a slight twitch in the left angle of the mouth and left side of the chin. In other fits the first spasm was a slight movement of the head, first to the left, then to the right; and as the head turned to the right, the right side of the mouth became drawn outwards, and the fit followed, with spasm in the right side of the face, as already described. Very frequently the eyes were first directed towards the left, then to the right, in the way just described, as the convulsion involved the right side of the face; and were subsequently turned to the left, and finally back again

to the right, in which position they remained for a minute or two after the fit was over. The position of the head, as a rule, corresponded to the movement of the eyes. The deviation of the head was distinctly the result of spasm in the sterno-mastoid on the side opposite to that to which the head was turned.

*Ophthalmoscopic observation during the fit.*—During one severe fit, in which the left eye remained open while the right was closed, I was able to watch a retinal artery and vein by the direct method of observation, from the very commencement to the end of the fit. Not the slightest diminution of their calibre could be observed; the artery remained of precisely the same size. When respiration was arrested and the face became dusky, the vein appeared distended and darker; no other change was observed. It is to be remarked, in connexion with this absence of spasm of the retinal vessels, that pallor of the face was likewise absent.

#### REMARKS.

Among the interesting points presented by the case is the commencement of the convulsion in the muscles of mastication. The involvement of those muscles in the course of a fit is common enough, but it is rare for them to be the seat of the first spasm in a convulsion of deliberate march. I am not aware that spasm in the palate has been before observed. Its distinctness in this case, and correspondence in time with the clonic spasm in the tongue and muscles of mastication, make it probable that the three are commonly associated.

Whilst the mouth was held open the mechanism of tongue-biting could be very distinctly observed—the gradual jerking forwards of the tongue till its tip was thrust between the champing jaws.

*Relation of tonic to clonic spasm.*—The essential unity in nature of the tonic and clonic spasm was in this case very distinct. At first the contraction appeared, to both eye and hand, to be continuous—i. e., tonic. Long before the least intermission in the continuity of the spasm was visible to the eye, the hand laid upon the convulsed part could detect that the apparently continuous spasm was really a succession of contractions which by their quick repetition produced a tetanic state, and, though they could not be seen, could be felt as rapidly recurring vibrations. Gradually, the interval between these contractions becoming longer, the intermission was distinctly visible, and, becoming still more complete, the characteristic clonic stage was developed.

I do not think that this relation between the tonic and clonic spasm has received the attention which it deserves. If the difference between them depend in all cases, as I believe it does, merely on the interval between the successive muscular contractions, and the transition between the two be perfectly gradual, it is not easy to accept the difference of cause commonly assumed for the two forms, and which refers the tonic spasm to the “spontaneous” undue action of the nerve-centre—the clonic to its irritation by venous blood. The inference from their essential unity is the unity of their cause.

*The relative affection of the muscles of the two sides* presented some peculiar features. The equal affection of the muscles of mastication of the two sides is in full accordance with their bilateral use. So, also, according to the usual law of con-

vulsive seizures, the muscles of the forehead were affected simultaneously on both sides; while those attached to the angle of the mouth were affected only on one side at a time. Curiously, however, the orbicularis palpebrarum was affected on both sides in some fits; on one side only in others. The mode of affection of the limbs is not easy to explain. Invariably one arm and both legs were convulsed, the other arm escaping entirely. May it be connected with the more frequent simultaneous use of the legs than of the arms? It is to be observed that, in the right leg, spasm of the extensors predominated; while in the left leg that of the flexors was distinctly greater than that of the extensors.

Not less singular is the alternation which existed in the commencing spasm of the head. The spasm on the side chiefly affected (right) was preceded by transient contraction on the opposite (left) side, and even by a still earlier slight and passing affection on the right side. This preliminary alternation may, however, be compared to that which is seen not unfrequently at the close of an epileptic fit, in which the head is, at the commencement, turned to one side. In these cases, as the fit is passing off, it is common to see the head and eyes gradually turn towards the other side from which they turned at the commencement of the fit, and remain for a little while in this position after the fit has ceased. This deviation is not due to paralysis by exhaustion of the side first affected, but is the distinct result of the development of spasm on the opposite side. These two forms of alternate movements—the preliminary alternation which precedes the fit, and the subsequent alternation during its course—may be fairly compared. The latter is regarded by Dr. Hughlings Jackson as an instance of the influence exerted by each half of the brain upon the muscles of both sides of the body. The preliminary alternation I have described may be thus explained, or it may be regarded as an instance of reciprocal action between the two halves of the brain, related in a curious way to the development of the spasmodic process. The commencing evolution of the fit is accompanied by a similar process on the other side more easily manifesting itself than the severer “discharge” on the side chiefly in operation, but transient and ceasing, perhaps by inhibition, as the intenser action of that side is evolved.

The absence of any arterial spasm in the retina during the fit is a feature of considerable interest. It is not, however, surprising; for it accords with the entire absence of facial pallor. But it proves, at any rate, that a severe fit may occur under the circumstances of cerebral irritation without any evidence of coincident arterial spasm.

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#### STEALING AS A SYMPTOM OF GENERAL PARALYSIS.

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THERE can be no doubt that no little popular suspicion meets the allegation of insanity when it

is made in defence of a person who is on his trial for the perpetration of some crime. Nor can it be said that the suspicion is entirely unwarranted by the use, or misuse, which is sometimes made of this mode of defence. It is too often had resort to by lawyers merely as a last resource, when all other means of defence fail, and when there is no real justification for setting it up. Moreover, there is a popular feeling, which judges commonly share, that it does not require any special knowledge in order to settle whether a man is mad or not, and that those who have made a special study of the subject of insanity are sure to discover symptoms of the disease wherever they look earnestly for it. Of a great many cases of insanity it is quite true that the public can judge almost as well as the doctors; the wayfaring man, though a fool, is not likely to make a mistake concerning them. In respect of a certain proportion of cases it may be admitted that doubts and differences of opinion are justified; belonging to the borderland between insanity and crime, they may be reckoned insane or criminal according to the standpoint from which they are looked at. But there are not a few cases in which the symptoms, though positive and definite, are not recognised and rightly interpreted by anyone who has not, by close observation of the manifold varieties of mental derangement and practical experience in dealing with them, acquired an intimate knowledge of what they betoken. If he describes them to the lawyers or to the public, and expounds their meaning, he is thought to be making much ado about nothing by detecting evidence of madness in innocent trifles, if he is not met outright with ridicule and scorn. It is not difficult for ignorance, appealing to the prejudices of ignorance, to raise an empty laugh against a truth of which there is not the least comprehension.

Among these cases of mental derangement which are apt to be overlooked or misunderstood are cases of general paralysis of the insane in their early stages. No form of insanity has been more studied or is better known than this. Its symptoms are, though slight at first, definite and characteristic from the beginning; its course is wonderfully uniform; and its mode of termination and the time thereof may be predicted with considerable accuracy. Moreover, unlike other forms of insanity, it presents motor as well as mental symptoms from the commencement; wherefore it might be said to exact attention and to claim recognition from those who have not made a study of mental diseases. Nevertheless, the most grievous mistakes are often made concerning this disease in its early stages, not by lawyers and juries only, but by medical practitioners; and so it happens that patients struck with fatal organic disease of the brain, declaring itself by symptoms which could hardly speak more plainly than they do, are tried, sentenced, and punished as common-place criminals.

It is well known to those who know anything of insanity that a propensity to steal is a striking symptom in the early stages of some cases of general paralysis. A person whose character has been irreproachable in all the relations of life, and whom no one would ever have suspected of an inclination to break the eighth commandment, after surprising and distressing his friends by irregularities of conduct at variance with the respectable uniformity of his former life, seems to lose the

consciousness of the difference between what is his and what belongs to another, and in the quietest way, as if he were doing nothing extraordinary, appropriates what strikes his fancy at the moment, and what he has, perhaps, no use for, and, when he has got it, makes no use of. The stealing is often done in a stupid way, without any adequate motive or without the outlook of any gain thereby, apparently in obedience to an impulse to possess springing up in a mind in which the sense of right and wrong has been weakened or extinguished. In some cases the patient makes no attempt at concealment; but in other cases there lingers a remnant of the sense of right and wrong which, too feeble to contend with the stealing impulse, leads to bungling attempts to hide the petty larceny.

In the *Journal of Mental Science* for January, 1878, Dr. Wilkie Burman relates the particulars of six well-marked cases of general paralysis admitted into the West Riding Asylum at Wakefield, *after having undergone the whole or the greater part of their punishment in gaol for larceny*; and, in regard to these cases, he expresses his conviction that the disease might easily have been diagnosed at the time of imprisonment, without any very prolonged examination, "by any medical man who had even the most rudimentary knowledge of the symptoms of general paralysis." Indeed, in one of these cases the disease was actually recognised by a barrister who was present in court when the man was tried, and yet this unfortunate man remained in gaol for five months before being sent to the asylum; he underwent the punishment of a criminal for five months after a hopeless disease of the brain had begun to make its fatal progress. Another person suffering from general paralysis was sentenced to six months' imprisonment for stealing two wheelbarrows and twelve hundredweight of coals in open daylight, without any attempt at concealment, and without being in want of them, as he was in comfortable circumstances. He was kept in prison for four months, having been in the hospital occasionally during that time on account, it was said, of "some slight bodily ailment." However, this slight bodily ailment did not fail eventually to culminate in such violence and excitement as necessitated the patient being restrained by a strait-jacket and confined in a padded room during the last three weeks of his imprisonment, after which he was sent to the asylum, where his disease made rapid progress. Another person was sent to gaol for twelve months for stealing some wine-glasses from an hotel. A fortnight after his discharge from prison he was admitted into the asylum in an advanced state of general paralysis, and he died about three weeks after his admission. These cases presented on admission into the asylum the usual exalted ideas of general paralysis, as well as the distinctive bodily symptoms. They and the other three cases which Dr. Burman mentions were admitted into the West Riding Asylum within a comparatively short time, and had presumably undergone their punishment in the gaol of the West Riding at Wakefield.

I will now give the particulars of a case that occurred in my practice, which illustrates the same lesson and excites the same painful reflections as Dr. Burman's cases. H. J. P.— was brought to see me in the early part of September, 1874. He had recently failed in his business, and his changed character and peculiar manner had for some time occasioned anxiety to his friends. It

was a question of the propriety of endeavoring to get him admitted into Bethlehem Hospital. When I saw him, his symptoms were such as led me to think that he was struck with general paralysis, and to say that he would probably not live two years. There was a slowness of conception, with a certain vacancy of look, which gave the appearance of some degree of stupidity; there was also exhibited at times a slight uncertainty, hardly amounting to tremulousness, in the action of the muscles around the mouth; and there was a remarkable incapacity to realise that there was anything the matter with him, or that his failure in business at all affected his future prospects. He seemed to think that it would be easy for him to go on as before, and that he would have no difficulty in getting advances of clothes from the houses which had suffered by his failure. At the same time, when it was pointed out to him how unlikely this was, he assented in a placid and indifferent way, but evidently without sincerely realising what he assented to or being convinced by what was said. At the urgent desire of his wife, who could not be persuaded how seriously ill he was, and who was naturally unwilling to send him to an asylum, he was allowed to go with her to the seaside, she having been warned to never lose sight of him. While resting there he seemed to improve; but one day, having obtained some money from her, under I know not what pretext, he disappeared. The next thing that was heard of him was that he was in custody at Doncaster for stealing a watch. He had gone directly from his wife and taken the mail train to the north on the night of Sept. 24th, 1874, and at Peterborough had got into a carriage in which was another passenger. This person went to sleep, and when he awoke his gold watch and his fellow-passenger were gone. When the train was searched, H. J. P— was found in another carriage, and the stolen watch was underneath the seat on which he was sitting. When taken to the police-office, he remarked to the constable, in reference to the handcuffs which had been put on him: "You should not have put these things on me. Oh, what a disgrace!" Knowing the condition of disease in which he was, I was not greatly surprised when told by his friends what he had done, and at their request I willingly gave them a certificate that he was in my opinion a person of unsound mind, being in the first stage of general paralysis, and that arrangements had been in contemplation for placing him in an asylum. However, this view of his state did not commend itself to the surgeon of Wakefield Gaol, who could find nothing the matter with him, and had no hesitation in declaring him to be quite sound. Feeling that, under these circumstances, a great injustice was likely to be done to a man who was afflicted with hopeless organic disease of the brain, I wrote to Dr. Crichton Browne, the well-known superintendent of the West Riding Asylum, begging him kindly to examine the man, and, if he found him really afflicted, to do what he could to help him. Dr. Browne readily consented to do so, and, having carefully examined him, came to the same conclusion as I had done, that he was laboring under general paralysis and was not responsible for his actions. Moreover, Dr. Browne was so good as to attend at the man's trial and to give decisive evidence to that effect. Dr. Watts, who had been his ordinary medical attendant in London, was also present at the trial, and gave similar evidence.

But it was all in vain. Dr. Wood, the surgeon of the gaol, stated emphatically that he had watched the prisoner carefully for a month, and that he was "sound in body and mind," and the evidence in his favor was received with open incredulity. "I shall not easily forget," Dr. Brown wrote to me, "the smiles of incredulity which pervaded the Doncaster Court-house, from the Recorder downwards, when I described the inequality of the pupils, slight tremor of the tongue, and other *little* symptoms which enabled me to recognise the justice of your diagnosis of general paralysis. I shall not easily forget the derision with which my prediction that the robust, healthy-looking man standing at the dock would not live above eighteen months was received on all hands. The recorder, taking into consideration the good character which the prisoner had previously borne, sentenced him to two months' imprisonment with hard labor. The poor man thus got the benefit of his previous good character, though he did not get the benefit of the disease which had produced the sad change in his character.

His friends very properly refused to let the matter remain so, and at once made such representations to the proper quarter, supported by affidavits, as led in a short time to the remission of the sentence. A few days after his discharge, on November 27th, I saw H. J. P— again, and questioned him about the theft, and the motives of it, and as to where he was going by the train. His account was that he thought he would go to Scotland, though he could give no satisfactory reason why he should go there, and would stop at York on the way, in order to see the cathedral; that the idea of taking the watch came into his mind when he saw his fellow-passenger asleep; and that, having taken it, he got out of the carriage, and made his way to another carriage. He was quite insensible to any feeling of shame on account of what he had done, and seemed unable to realise its criminal nature; nor did he evince any sense of disgrace on account of having been in prison, talking of it in fact as freely and unconcernedly as he might have done of a friend's house in which he had been staying for his health's sake. I recommended that he should be taken to Dr. Watts for the purpose of obtaining a certificate of his insanity, agreeing to sign the second certificate myself, and that he should be sent to an asylum; enjoining upon his friends that he should meanwhile be closely watched, as it seemed certain that he would do something extraordinary if he were not under control. Divided family counsels prevented his being put immediately under restraint, and the next news which I had of him was contained in the following paragraph which appeared in the newspapers:—

*"Extraordinary Capture of a Thief.*—Soon after midnight on Thursday, when the mail train for London had passed the Tuxford station, a man covered with blood went to the signalman's box and stated that he had fallen from one of their carriages. His face, head, and hands were very badly cut and bruised, but the railway official had his suspicions aroused and telegraphed to Retford, the next station, for the train to be examined on its arrival there. In a minute or two he received directions, in answer to his telegram, to detain the man, as a robbery had been committed. The man, not knowing that the officials had telegraphed to Retford, asked that he might be sent back to

London to his friends by the next train, as his injuries were so severe that he did not feel able to continue his journey to Manchester, for which place he had taken a ticket at King's-cross station. A doctor was sent for, and, after he had dressed his wounds, Sergeant Hallam, of the Notts police, stepped in and apprehended him. On searching him a false beard and mustache were found in one of his pockets, and in another a dagger nine inches long—a most formidable weapon, as sharp as a razor. Two watches were found upon him. It appears that the prisoner had been riding in the same compartment with Mr. Robinson, a Manchester horse-dealer, and one other person. All save the prisoner went to sleep after leaving Peterborough, and did not wake again until they were aroused at Retford to find their companion, the prisoner, gone, and one of their watches also. It is supposed that the prisoner, after stealing the watch from one of the sleeping travellers, left the compartment, and tried to get into another. As the mail was running along at the rate of sixty miles an hour, he, failing to find a compartment which he might enter unobserved, either jumped off or fell from the train. He is a clean-shaved, thick-set, powerful man, and has given the name of Henry James Price. He is now detained in the Retford Police-station, and will be brought up to-day."

Here was a nearly exact repetition of his former performance. He had been again going to the north without any apparent reason, and on his way had again stolen the watch of a sleeping passenger, but this time he had evidently gone with evil design, else why should he have provided himself with the false beard and mustache, and the formidable dagger? The result of the adventure was that he was on Dec. 7th committed to the county gaol at Nottingham to take his trial, but he had not been there long before incontestable symptoms of insanity manifested themselves. Thereupon he was removed, on Jan. 14th, 1875, to the county asylum. On Feb. 24th he had three severe fits of an epileptic character; similar fits recurred from time to time during the following month; his mind became more and more enfeebled, and his bodily strength declined; furious mania supervened, and he died from exhaustion on August 31st, after being raving mad for eight weeks.

Comment upon this case is unnecessary. It will be enough to express regret that the unhappy sufferer should not have found in medical help the protection and treatment which his sad and hopeless disease demanded, and a conviction that the time has come when it is the duty of medical corporations to exact some knowledge of mental diseases from those upon whom they confer their licences.

Hanover-square, W.

## ON THE RAPID RELIEF OF NEURALGIC PAIN.

By SPENCER THOMSON, M.D.

AMIDST the various improved methods of treatment which have become established in the prac-

tice of medicine during the last twenty years none are more strikingly beneficial than those which enable us to subdue, with tolerable certainty and celerity, the agony of neuralgic pain, or of what, for want of a better word, or perhaps deeper knowledge, we call neuralgia. It needs not but to refer to works on Practice of Medicine, published not so long since, to see how little comparatively in the way of relief could be afforded during the paroxysm. For this external applications were chiefly trusted to, in the hope, often vain, that they might in some degree palliate the suffering, until the disease itself had been conquered after a longer or shorter interval by the not always certain quinine, carbonate of iron, arsenic, or other anti-periodics. All this is greatly altered, and I think we may now congratulate ourselves that a large number of cases of so-called neuralgia may be quickly, either permanently cured by the relieving remedy, such as phosphorus, or relieved, until such time as specially curative agents, or curative general treatment, have removed the tendency to the recurrence of the pain. As one of the newest of the remedies, I would first allude to one which is much too slowly making its way into the domain of practical therapeutics; I allude to the recently introduced "incture of Gelseminum semper-virens," or yellow jasmine. In my presidential address delivered before the South-Western Branch of the British Medical Association, in 1874, I alluded to this remedy as having proved very successful in my hands, and in a paper I read this year at the Plymouth meeting I was able to state how fully it had fulfilled my expectations during the twelve months that had elapsed since my former notice of it. Directly or indirectly it had been used by me, or by my authority, in at least forty cases to which it was applicable, and with almost constant success. In using the word "applicable," I do so in accordance with my own experience that the remedial power of the gelseminum seems confined to those branches of the trifacial nerve supplying the upper and lower jaw, more particularly the latter, and more especially when in either jaw the pain is most directly referred to the teeth or alveoli; indeed, I can scarcely recall an instance of the above in which relief was not speedily and thoroughly given. The usual expression of the patient has been, "It acted like a charm." In illustration I give one case.

On Sunday afternoon, June 20th, the housemaid of a friend, a retired medical man, came to me with a note from her master, stating that she had been suffering from agonising pain, of what was thought to be toothache, for six-and-thirty hours. Nothing gave relief, and no dentist could be found to remove the only suspicious tooth. I sent her home with a bottle of gelseminum tincture, which I keep for home use, desiring that she should have twenty minims at once, and twenty more within two hours if not relieved. Her master sent me a note in which he stated that the patient had experienced immediate relief.

The above case was not one of distinct toothache, but rather of pain affecting the alveoli generally of the affected jaw. Still, even in toothache seated in one tooth, the remedy gives relief, provided, of course, abscess is not actually in formation. I have observed above, that, according to my own experience, the beneficial effect of the gelseminum is confined to neuralgic pain of jaws generally, and of teeth and alveoli more particu-

larly; and a short paper, in the *Practitioner* for August 1875, by Dr. Gamgee, of Birmingham, supports the view. In September, 1875, there were published some cases of other neuralgias, even one of sciatica, in which cure was effected, under the care of Dr. A. Jurasz, of Heidelberg. Should the remedy indeed prove generally useful in neuralgia, it will of course give it additional value in our materia medica, but at present it has gained no such position, either according to my experience, or, as far as I can learn, that of most others.

In the notices I have met with on the use of the gelseminum, the doses quoted seem all too small. I now almost invariably prescribe, for an adult, twenty minims of the tincture as a first dose, to be repeated any time after an hour and a half if relief is not given. I have rarely had to order a third dose, and I have never found any inconvenience result from the larger doses. In one instance, a gentleman who, unadvisedly, took thirty minims at once, and immediately afterwards went out driving, told me he experienced for an hour or two some uncertainty of vision when guiding his horse. A severe attack of neuralgia of the jaw was, however, cured by the one dose, and did not return. One young lady, to whom I gave two twenty-minim doses during the night for a severe neuralgic attack, more particularly of the temporo-auricular branch of the inferior maxillary nerve, complained of a little heaviness next morning. In this case little if any relief was given; but the teeth and alveoli were not implicated, and it is only when these are that complete relief can be calculated on according to my own experience.\* The above case was at once cured by the solution of phosphorus, to be noted presently.

As further illustration, I may mention the case of a lady who was under my care last winter for local disorder, but who also suffered severely from neuralgia, attacking at one time the lower jaw and at another the orbital and frontal nerves. The gelseminum invariably relieves the maxillary pain, but has no effect whatever over the frontal. For this, however, for a long time at least, I found a most efficient remedy in phosphorus, given in the liquid form. The form I have used is that given by Ashburton Thompson in the *Practitioner* for Oct. 1873. It is taken without repugnance, rarely causing disorder of the stomach or eructation, and, what is most important, keeping perfectly. One of the cases I have mentioned was treated with a preparation which had been made four months at least. I have found a twenty-minim dose, equal to one thirty-sixth of a grain of phosphorus, give rapid relief, and, what is important, independent of locality.

Even phosphorus, however, we know, will, after a time, lose its power in some obstinate cases of neuralgia—at all events its power of giving rapid relief; and then it is that the invaluable hypodermic administration of morphia comes to our aid. This remedy, and its mode of administration, are too well known to require comment here; but it is far from being as generally employed as it ought to be. This, perhaps, is due to various causes, but of these I believe the principal are—the means of administration not being always readily available, and the objection of patients to the pain conse-

quent upon the use of coarsely constructed instruments. The first of these objections I have endeavored to meet by the use of a very portable hypodermic apparatus, enclosed in a metallic case, with ample supply of needles, and the great desideratum, an always moist and efficient piston; and by always carrying a supply of Sansom's gelatine discs, as made by Messrs. Savory and Moore. The second objection is met by the use of very fine steel needles only, as made for me by Mr. Hawksley, of Oxford-street. The disc, which contain one-sixth of morphia in each, are a very safe and efficient dose for most cases, although in some it may be well to begin with a less amount, and in many it may be advisable to increase the dose considerably—half a grain, or even double that amount. I may here give it as the result of a very large experience in the hypodermic administration of morphia, that concentrated solutions are the reverse of advantageous. In the first place, they are not so safe as the more dilute; and, in the second, they do not act so quickly and agreeably. The usual strength I employ is one grain of hydrochlorate of morphia in forty minims of water, rarely in thirty. The slight increase of bulk is of no consequence, and in administrations I can count by the thousand I have never seen the slightest bad consequence, in the way of abscess or otherwise, result to the patient.

With morphia, and occasionally—but only occasionally—atropia, to use hypodermically; with phosphorus in solution; with gelseminum, aided at times by the ordinary external appliances, such as heat, or freezing if need be; aconite, and chloroform,—one ought to feel fully prepared to meet and subdue at the time most cases of neuralgic pain, and, indeed, of pain generally.

Of course the after-treatment, which is to obviate the recurrence of the disease, does not fall within the scope of this paper. This paper would not, however, be complete without some notice of other remedies which have lately come to the front in the treatment of neuralgia. Of these the Calabar bean, as advocated by Dr. Munro, deserves a thorough trial. In one case only have I used the discs introduced under the eyelid, but in that a severe frontal neuralgia was certainly alleviated; having other remedies in which I placed confidence, I probably did not persevere sufficiently. Fleming's tincture of aconite in one minim doses repeated at intervals of an hour, I have found relieve severe neuralgia of the eyeball, and the tincture of *actæa racemosa* very useful when pain in the same situation seemed the result of a general rheumatic condition.

The object of this paper, however, is not to enumerate the long list of remedies, internal and external, which have been used in the treatment of neuralgia—a list which shows how urgently a successful treatment was needed,—but rather to direct attention to the remedies I have dwelt upon. I cannot, however, close without adverting to Dr. Evans's paper in the *Practitioner* for September, 1875, upon "Nitrite of Amyl in Facial Neuralgia." His account of the relief afforded in the anæmic cases would point to this new agent as one requiring careful trial, hopeful of results.

Ashton, Torquay.

\* That gelseminum has not yet received the attention it merits is evident from the difficulty of procuring it. During the meeting in Edinburgh in August, I inquired for it in vain at most of the principal chemists.

## TWO CASES OF EXCISION OF CANCER OF THE BREAST BY SCISSORS-CUTTING UNDER ETHER SPRAY.

By THOMAS MOORE, F.R.C.S. Exam.

As the exhibition of a general anæsthetic during an operation always entails more or less risk to the life of the patient, and a corresponding degree of anxiety on the operator, any other means of producing insensibility to pain should be a matter of great interest to the profession. The use of our best local anæsthetic—freezing by ether spray—has, unfortunately, hitherto been almost impossible in operations where the incisions have to be carried to any depth, owing to the difficulty of cutting through the hardened tissues. In an article in *THE LANCET* for November, 1874, Dr. B. W. Richardson asserted that he had overcome this difficulty, so far as operations on the breast at least were concerned, by the substitution of scissors for the knife; and he gave the history of two cases in which he had tried this method with unequivocal success. Since that time two patients have come under my care suffering from cancer of the breast, and at the same time from disease of the heart. As I made use of Dr. Richardson's operation in each of these cases, an account of my experiences with it may, perhaps, prove of interest, and will, I hope, induce others to make trial of it.

CASE 1 was that of a maiden lady, aged forty-eight, from whose right breast I had, in July 1873, removed an adenocoele without the aid of any anæsthetic. Several members of her family had died from cancer, but this tumour did not present features of malignancy. Neither she nor her friends would consent to its removal until it had become as large as a cocoa-nut, and a considerable surface of the skin over it had ulcerated. From this surface there had been several attacks of hæmorrhage, uncontrollable by styptics; and removal of the tumour appeared to afford the only hope of averting her speedy death. The heart's action was labored and irregular, with a loud systolic murmur; the pulse was intermittent and feeble; and she had become almost childlike from debility. Under these circumstances a general anæsthetic seemed out of the question, so I proceeded to operate without one, having previously exhibited brandy-and-water largely. The operation presented no special features of difficulty, but although the sensitiveness of the patient was considerably lessened by the state of almost dementia into which she had fallen, she yet suffered much pain. The after-progress of the case was satisfactory, the wound healed quickly, and the heart's action and the mental state both gradually improved.

When this operation was performed, a hard tumour, the size of a hazel-nut, could be felt in the other breast. This gradually increased in size, but my patient declined to have it removed until it had become as large as a turkey's egg, was very painful, and the skin over it was retracted. As the cardiac murmur and some irregularity of the pulse still persisted, I did not think it advisable to recommend a general anæsthetic; but at length (on the 19th of January last) induced her to allow me to operate by Dr. Richardson's method.

The ether spray was used by my partner, Mr. Cross, in accordance with the directions given by

Dr. Richardson in the article referred to above. First a spray of common ether was directed over the breast for five minutes to chill it, and then a spray of anæsthetic ether for about three minutes until the part was frozen. I then cut the flaps with a pair of sharp-edged scissors, but I did not carry the incisions as low as the pectoral surface of the tumour. So far my patient did not complain of any pain. I then proceeded to use a pair of tooth-edged scissors to the deeper parts, but I found it impossible to raise the tumour from its attachments, partly because it was adherent to the pectoral muscle, but principally, I think, and as subsequent experience has shown me, because I had not made the first incisions deep enough. A considerable quantity of blood now welled up into the wound, and the freezing was consequently ineffectual. As my patient began to suffer much, and the rate of progress made by the tooth-edged scissors was slow, I was constrained to take up a scalpel and finish the operation as quickly as possible. The wound, which was dressed with oiled lint and cotton wool, subsequently healed fairly well.

CASE 2.—A maiden lady, aged sixty-four, came on Sept. 9th, from a town fifty miles distant, to place herself under my care. She was suffering from a very hard scirrhus tumour of the left breast, rather larger than a turkey's egg, which she had first noticed eight months before, when it was as large as a walnut. There was no adhesion to the parts beneath, nor were there any glandular swellings, but there was some retraction of the skin over the centre of the tumour, and much lancinating pain. A niece had died from cancer six months before, but there was no history of the disease having shown itself in any other member of her family. She was thin and looked sallow, but her friends assured me that she had not altered in appearance for many years. The heart sounds were feeble, with a systolic murmur, and the pulse was very small and weak at the wrist. She informed me that her usual medical attendant had told her that she was suffering from heart disease.

As a general anæsthetic appeared to be contra-indicated, I determined to give Dr. Richardson's method another trial, in spite of my previous somewhat unfavorable experience of it, especially as I felt that most of the hæmorrhage and pain which occurred in the former case might have been avoided, if the parts had been more decidedly frozen, and if the incisions for making the flaps had been carried to their full depth at once.

On the 14th of September the operation was performed as follows:—First a spray of common ether was directed on to the breast for five minutes; then two sprays of anæsthetic ether were directed—the one by Mr. Cross, and the other by our assistant, Mr. Bayfield—on either side of the tumour for five more minutes, until the whole breast was frozen quite hard. I then, after making an angular cut in the skin at the outer margin of the tumour, carried the lower blade of the cutting-scissors deeply down through the breast until it appeared to rest upon the pectoral muscle. Then, keeping this blade as deep as possible, I easily cut the lower flap, about an inch from the tumour, with three or four strokes of the scissors. The upper flap was cut as easily. I next thrust the fingers and thumb of my left hand deep into the wound, and, grasping the tumour firmly, raised it as far as possible from the pectoral muscle. It



was then easy to detach it with a few strokes of a pair of tooth-edged scissors. The operation so far was completed in less than three minutes from the time of the commencement of the first incision, and was attended with very little loss of blood. When the spray was withdrawn there was some hæmorrhage from three small vessels in the tissues which had been cut by the sharp-edged scissors, two of which were treated by torsion, and the other tied with silk, the ends of the ligature being cut off short. The edges of the wound were brought together by six sutures, and each of the twelve spots through which the needle was passed was previously separately frozen by the spray.

My patient, who declared beforehand that she was extremely sensitive to pain, gave very little indication of having felt any during the operation, and said afterwards that "it hurt her, but not a great deal." That her estimate of her extreme sensitiveness was correct (and indirectly the success of the anæsthetic) was proved by the fact that, during the introduction of one of the sutures through a part of the skin which had been accidentally insufficiently frozen, she cried out loudly, and declared that this "hurt her worse than all the rest put together."

The wound, which was dressed with oiled lint and cotton-wool, united by first intention, except in a spot where I had made a slight notch at the junction of two cuts of the scissors, and at the place of the first incision; but there never was more than just enough discharge to moisten the dressing, and that was entirely dried up by the sixteenth day. The patient was confined to her bed for one day, and to her bedroom and an adjoining sitting-room for a week.

The scissors used for making the first incisions were ordinary "elbow-scissors," with the blades inclined to the handles at about a third of a right angle; those for making the deeper incisions were tooth-edged and slightly curved "on the flat of the blade."

My experience of these operations has shown me that in using this method three things must be particularly attended to:—1. That the whole breast should be thoroughly frozen before the commencement of the operation, as otherwise hæmorrhage may afterwards prevent the freezing action of the spray. 2. That the incisions should be made at once to their full depth, as the difficulty of afterwards carrying them deeper, especially if there be hæmorrhage, is considerable. 3. That great care should be taken not to notch the skin, as doing so with scissors bruises as well as cuts it, and retards the healing process.

The success of my second operation, in the satisfaction it gave both to my patient and to myself, was such that I shall not hesitate to employ this method for the future for the excision of any tumour which does not require dissecting out from the subjacent tissues; for I was able to perform it about as quickly as I have performed similar operations with the knife under chloroform, and the wound healed as rapidly as could be desired.

Petersfield.

## CASES OF DIABETES MELLITUS.

By M. CHARTERIS, M.D.,

Physician and Lecturer on Clinical Medicine, Glasgow Royal Infirmary.

WHILE treating two cases of diabetes in my wards in the Royal Infirmary I became acquainted with the details of the following case from the personal narration of the patient.

A. B.—, aged fifty-two, in an excellent business position in the city, in 1869 became aware of his having diabetes, and his usual medical attendant ordered him a diet consisting of beef and milk and dry toast. At that time he voided daily about 250 oz. of urine, with a specific gravity of 1044. He continued under that treatment for about a year and a half. The quantity varied little, and the specific gravity remained the same. The dietary became very irksome to him, and he had lost in weight about a stone and a half. A consulting physician who was called in recommended a purely skimmed-milk diet. This was adopted in 1872, and was continued for two years and three months. He drank thirteen pints or 260 oz. of milk daily, and passed about the same quantity of urine. Latterly he decreased the quantity of milk, because so much became nauseous to him, until it fell to 180 oz., the urine voided falling to 140 or 150 oz. The specific gravity of the urine under this treatment was 1020, but though low it was still loaded with sugar whenever it was tested. His weight had decreased to 11 st., and he was becoming despondent and extremely feeble when he made, as he terms it, his discovery about diabetes. He found that he commenced to wheeze when he breathed the cold air, and that it ceased on his return to a warm room. On putting his head below the bedclothes a slight perspiration came upon him, the saliva returned, and his tongue and mouth became moist, instead of dry, as formerly. When he withdrew his head again, and breathed in the open, his mouth and tongue again became dry and parched. This moistness and dryness of the mouth alternately occurring under the conditions mentioned having arrested his attention, the question arose in his mind, how could this moisture be obtained without remaining in bed? To accomplish this he put on a respirator, and also a knitted woollen cloth over both the respirator and his nostrils when in the house, or even in bed, and was careful in protecting the nostrils as well when he went out. He also began to practise breathing by the nostrils alone, and found that breathing exclusively in this manner day and night, except when engaged in conversation, was highly beneficial. Having perfected himself in respiring by the nostrils alone, he laid aside both the respirator and the cloth, only muffling himself carefully up when he went out at night or in frosty weather. He avoided going out at night as much as possible, and refrained from all cold diet or drink, invariably taking them warm. Under this treatment an amendment was apparent in less than fourteen days, and in less than a month it was very marked. The quantity of urine and sugar steadily decreased, while his weight increased, so that in six months he had regained his usual weight of 13½ st. The sugar at the same time disappeared from his urine, and he had acquired his usual health and spirits. He has continued in this



favorable condition for the last two years, and in addition to the milk (heated) which still forms his staple article of diet, he is able to take some toasted bread and potatoes, and in addition a glass or two of wine at dinner. In fact, he lives like any other temperate man, and, being a very intelligent person, he has formed his theory in regard to the treatment, as already mentioned. Briefly expressed in his own words, it is this:—"Hitherto the attempt has been made to prevent production of sugar by giving a non-saccharine diet. This is no doubt perfectly correct, but in addition to this the treatment I adopted was intended to promote the consumption of sugar produced. This design of consuming sugar by breathing through the nostrils in warm weather or by means of a respirator, is that when the proper quantity of sugar has been consumed, the abnormal production will then cease. The aim of this treatment is to raise the blood-heat to its proper temperature, and to restore to the lungs their partially lost combusive power, and so enable them to consume as much secreted sugar as will maintain the blood at its proper temperature. When that purpose is accomplished the organs will regain their proper function, and the patient recover."

As previously observed, two cases of diabetes were in my wards in the Royal Infirmary, and I resolved to try the treatment mentioned upon them. The patients were informed of the object in view, and aided our efforts in every way.

**CASE 1.**—Patient, a single man, aged twenty-eight, was admitted passing 260 oz. of urine on the 14th of June. His disease had lasted twelve months, and various modes of treatment had been put in force and abandoned. The specific gravity of his urine in the morning was found to be 1085, and in the evening 1083, his weight being 10 st. 3 lb. In accordance with the principle mentioned in the foregoing case, he was ordered to wear a respirator during the day, and at night to cover the respirator and the nostrils with a knitted woollen cloth. The following was the dietary in this and the succeeding case:—Breakfast: Eggs, fish, one pint of tea, and biscuits. Dinner: Steak, biscuits, and cabbages. Supper: Tea, biscuits, and milk. Three pints of sweet milk were also taken during the day. The biscuits were prepared at my suggestion by Mr. Walker, biscuit manufacturer, of this city, who, after repeated trials, made a biscuit palatable to the taste, and possessing no, or at least only a very small quantity of, starch in its composition. On the 18th of June, 1875, the patient stated that he perspired freely, and that, on awaking, his mouth was not parched but moist. The quantity of urine passed, which was carefully ascertained every day, was as follows on the dates mentioned.

|           | Total amount<br>in ounces. | Specific gravity,<br>10 A.M. | Specific gravity,<br>10 P.M. | Weight.    |
|-----------|----------------------------|------------------------------|------------------------------|------------|
| June 18th | 248 ...                    | 1040 ...                     | 1038 ...                     | —          |
| " 22nd    | 236 ...                    | 1037 ...                     | 1031 ...                     | 10st. 0lb. |
| " 26th    | 230 ...                    | 1035 ...                     | 1030 ...                     | —          |
| " 30th    | 218 ...                    | 1033 ...                     | 1029 ...                     | 9st. 9lb.  |
| July 3rd  | 212 ...                    | 1039 ...                     | 1030 ...                     | 9st. 11lb. |
| " 7th     | 200 ...                    | 1033 ...                     | 1030 ...                     | —          |
| " 11th    | 168 ...                    | 1037 ...                     | 1034 ...                     | 9st. 10lb. |
| " 15th    | 150 ...                    | 1037 ...                     | 1034 ...                     | —          |
| " 22nd    | 120 ...                    | 1032 ...                     | 1032 ...                     | 10st. 0lb. |
| " 26th    | 100 ...                    | 1034 ...                     | 1033 ...                     | —          |

After this, he went to the Seaside Home at Dunoon, and subsequently resumed his occupation in a distant part of the country, and was able satis-

factorily to do so according to the account of his friends.

**CASE 2.**—The patient was a married man of healthy parents, and employed as a railway pointsman in a country district. He observed that he was passing more than an average amount of urine twelve months ago, but thought nothing of it until he found his sexual powers entirely gone. His urine was tested, and gave abundant evidence of its saccharine properties. On admission the quantity passed in twenty-four hours was 330 ounces. The patient complained of great thirst, gradually increasing weakness, pain in his loins, and a numbness affecting especially his fingers and toes. With every anxiety to do what he was told, he found it extremely difficult to refrain from drinking water or any other liquid. A similar course of treatment as in the other case was adopted with the following results:—

| Date.      | Urine in<br>ounces. | Sp. gr.  | Sugar per<br>ounce. | Sugar per<br>diem. | Weight.    |
|------------|---------------------|----------|---------------------|--------------------|------------|
| April 25th | 330 ...             | 1084 ... | 34 ...              | 11-220 ...         | 9st. 5lb.  |
| May 17th   | 180 ...             | 1038 ... | 34 ...              | 6-120              |            |
| " 18th     | 190 ...             | 1035 ... | 35 ...              | 6-650              |            |
| " 19th     | 200 ...             | 1040 ... | 40 ...              | 8-000              |            |
| " 20th     | 200 ...             | 1036 ... | 30 ...              | 6-000 ...          | 10st. 2lb. |
| " 22nd     | 200 ...             | 1036 ... | 34 ...              | 6-800*             |            |
| " 24th     | 170 ...             | 1032 ... | 30 ...              | 5-100              |            |
| " 26th     | 130 ...             | 1032 ... | 32 ...              | 6-000 ...          | 9st. 12lb. |
| " 28th†    | 140 ...             | 1033 ... | 32 ...              | 4-480              |            |
| June 1st   | 135 ...             | 1032 ... | 32 ...              | 4-320              |            |
| " 3rd      | 130 ...             | 1031 ... | 31 ...              | 4-030              |            |
| " 4th      | 130 ...             | 1040 ... | 37-53...            | 4-880†             |            |
| " 7th      | 125 ...             | 1032 ... | 31 ...              | 3-875§             |            |
| " 9th      | 120 ...             | 1033 ... | 31-5 ...            | 3-780              |            |
| " 12th     | 120 ...             | 1027 ... | 28 ...              | 3-360              |            |
| " 15th     | 100 ...             | 1036 ... | 32 ...              | 3-200              |            |
| " 17th     | 100 ...             | 1031 ... | 30 ...              | 3-000              |            |
| " 19th     | 100 ...             | 1036 ... | 33 ...              | 3-630              |            |

\* Urates 1·05 per cent. † Went home for three days.

‡ Estimated by Dr. Milne. § Urates '95 per cent.

I saw the patient again on 23rd Sept. He was employed as a railway porter. His weight was 11 st. The specific gravity of the urine was 1032, and the quantity voided in the twenty-four hours was 120 ounces. The usual tests indicate the presence of sugar.

**Remarks.**—I have not hesitated to give the details of these cases to the profession. The mode of treatment is simple, and in its originator's hands has been attended with the most beneficial results. In the two cases I had good also accrued, though not to the same extent. The publication of the cases will, I trust, stimulate others to give it a fair trial and record the results. It has one advantage—it cannot possibly do harm.

Glasgow.

#### NOTES ON A

#### CASE OF TUMOUR OF THE CEREBELLUM.

By RICHARD CATON, M.D.,

Lecturer on Physiology, Liverpool School of Medicine; Assistant-Physician to the Infirmary for Children.

On the 15th January, 1875, I was asked to see A. B—, a man somewhat under the middle height, of healthy appearance, aged twenty-eight, the manager of a large farm.

**History.**—About fifteen years ago patient had

an attack of rheumatic fever, which was believed to have left behind it some cardiac affection, which however, of late years had produced no symptoms of importance. Patient described himself as enjoying excellent health, and was apparently capable of active muscular exercise. About four months ago, when spending too much time in reading after his day's work was over, he suffered for a day or two from occipital headache. On discontinuing the reading this ceased.

Fourteen days before I saw him, having been somewhat short of laborers on his farm, he had helped the men to carry some distance, and to lift up a ladder, a large number of sacks, each weighing about 1½ cwt., the exertion being extremely severe. On that evening he was attacked by a violent pulsating headache in the occipital region. This had remained almost constant up to the time of my seeing him, and was so severe as to prevent sleep and render exertion impossible. He had had two or three attacks of vomiting.

*Symptoms when first seen.*—Severe pulsating headache in the occipital region complained of. Patient, who is a highly intelligent man, is quite clear intellectually, but is unable to bear much conversation, is very sensitive to noises, and suffers much from tinnitus. He exhibits some degree of difficulty and unsteadiness in walking; has no paralysis of motion or sensation; sight unaffected. He cannot recline on the back without increase of pain. Tongue furred; bowels constipated; no appetite; respiratory sounds normal; a remarkably loud, double aortic murmur; cardiac dulness perhaps slightly increased; pulse about 120, markedly aortic; temperature rather above the normal range; urine normal. He has always been strictly temperate, and has never had syphilis.

The *diagnosis* presented some little difficulty. I was in doubt between two theories—firstly, that of the existence of structural lesion of the brain; secondly, cerebral anæmia or some disturbance of brain circulation, due perhaps to mechanical injury of a previously diseased valve, sustained during the violent exertion on the day from which the symptoms dated. I rather inclined to the latter theory.

The *treatment* consisted in rest, the employment of counter-irritation over the nape of the neck, gentle aperients, and bromide of potassium, and subsequently iodide of potassium.

*Progress of the case.*—Coincidentally with the treatment referred to, improvement took place in some of the symptoms. The headache, instead of being constant, became intermittent, the remissions became longer, and, finally, in about ten days the headache had become only occasional; any excitement or over-exertion would bring it on. The appetite returned. Notwithstanding improvement in these respects, great and increasing muscular weakness was observed; the muscles were largely developed, but the patient, who a fortnight ago had been capable of muscular exertion such as few of his farm laborers could surpass, now could not ascend two pairs of stairs without assistance. His gait began to be more unsteady; he could not turn round with the eyes shut without falling. Eyesight perfectly good, but a remarkable slowness in accommodation manifested itself. In adjusting the focus of the eye from an object one foot distant to another at fifty feet, a delay of three seconds took place. I measured this carefully on several occasions. The movements of

the eyeball were normal; spectra in the form of blue rings were described.

These symptoms again excited fears of the existence of some structural lesion (perhaps of the cerebellum), and I decided to have a careful ophthalmoscopic examination made. Mr. Edgar Browne, surgeon to the Eye and Ear Infirmary, reported the presence of commencing optic neuritis about both discs, with dilated and tortuous vessels and one or two small hæmorrhages. This evidence was considered conclusive as to the existence of coarse disease, tumour, apoplexy, or abscess of the cerebellum being suggested. A very unfavorable prognosis was given. The eyesight as yet was quite good, but, notwithstanding appropriate treatment, the clouding of the retina was seen by us to spread steadily day by day, until at length, within about ten days from its first discovery, it produced loss of sight. About the same time the general symptoms became more severe, pulse and temperature rose, and occasional delirium occurred. Rheumatic symptoms were complained of, and pain in the loins drew attention again to the urine, which a few weeks back had been quite normal, but now was found loaded with albumen and containing numbers of granular tube-casts. Severe night-perspirations occurred; temperature often rose to 103°; pulse ranged from 110 to 130. The patient's hearing, which had formerly been morbidly acute, was now noticed to be defective on the left side. Several weeks now elapsed, during which no important change took place. Pain in the cardiac region and left hypochondrium were occasionally complained of. He suffered from a sense of oppression in the head, but only at intervals from headache, and was usually quite clear intellectually.

Towards the end of April, œdema of the legs appeared, and some fluid collected in the peritoneum. Occasional squint and signs of partial paralysis of the facial muscles of the right side became manifest. About the 1st May he began to have difficulty in expressing himself, on the 8th became gradually hemiplegic on the right side, and died on the 4th.

*Autopsy.*—Cerebral hemispheres normal externally. A tumour, the size of a small walnut, was found on the under surface of the left hemisphere of the cerebellum, adjacent to the pons, and beneath the auditory nerve, which was stretched over it. There was a small embolus in the left middle cerebral artery, beyond its first anterior branch. The ventricles contained two or three ounces of fluid.

*Remarks.*—The sudden onset of the symptoms immediately after violent muscular exertion, valvular disease being present, was very misleading, and caused at first an error in diagnosis. Subsequently the diminution of muscular power without paralysis, the ataxia, together with the occipital headache and optic neuritis, formed a group of symptoms on the whole characteristic of tumour of the cerebellum. The affection of hearing gave, later on, a clue as to the probable locality of the tumour. The slowness of accommodation is a symptom which I have not seen described before. It was very marked. If the patient glanced up from the book he was reading towards the figure of any person entering the room, he described himself as only being able for two or three seconds to see a dim haze, then he saw quite distinctly. Changes in focal adjustment were obviously made

slowly and with difficulty. Prof. Ferrier has shown how largely the cerebellum is concerned in the co-ordination of the muscles of the eyeball; has it a like control over the ciliary muscle and the mechanism of accommodation?

Liverpool.

## EMPHYEMA, FOLLOWING SCARLET FEVER: THORACENTESIS; RECOVERY.

By BENJAMIN WALKER, M.R.C.S., L.R.C.P., &c.

SARAH JANE W—, aged two years and a half, the child of healthy parents, was seized with convulsions on the 5th of April. The attack lasted about half an hour, and the left half of the body was chiefly affected, the left hand being very blue and the face much distorted. The left half of the body was quite powerless. Speech was not affected. On the following day the characteristic rash of scarlatina appeared. The nearest medical man was called in, and he attended her till the 16th, when she came under my care. This was the twelfth day of the illness. There was then considerable though not complete loss of power of the left half of the body; tongue dry and glazed; pulse 130, feeble and compressible; skin hot and dry. The temperature could not be taken at any time through the illness on account of the restlessness and fear of the child when approached. Throat affection slight. There was great thirst. The bowels had been freely opened by my predecessor. Bark and ammonia were now ordered, with beef-tea, egg, and brandy mixture at regular intervals, and, to quench the thirst, milk and lime-water *ad lib*.

May 1st.—Condition was one of hectic, with frequent flushings and rigors, and the child was greatly emaciated, the support being taken in a very desultory manner.

8th.—An abscess of considerable size under the left pectoral muscle was opened, and gave exit to about three ounces of fairly formed pus; there was a slight drain for a few days and then the discharge ceased. In the course of two weeks the left side of the chest began to increase in size, so that the measurement exceeded the right by about an inch; the heart was displaced to the right, so that the apex beat was to the right of the sternum, a little below and to the inner side of the right nipple. There had been a troublesome cough for three weeks past, latterly increasing in severity, but without much expectoration, till the 17th, when there was a copious discharge of pus tinged with blood, denoting the occurrence of bronchial fistula. Some relief followed this, and purulent matter was from time to time expectorated with the cough, in greater or less quantity; the chest measurement, however, was little affected, and the child continued in much the same state for the next six weeks, when the dyspnoea became daily more marked, and it was evident that, unless relief were obtained by other than nature's method, there would soon be a fatal termination, for the little patient was emaciated to an extreme degree and rapidly sinking from hectic.

July 15th.—With the assistance of my friend Mr. Foulds, who saw her in consultation, a medium-

sized needle of Maw's bottle aspirator was inserted, between the sixth and seventh ribs near their angles, and 20 oz. of odorless pus of the consistence and exact appearance of pea-soup drawn off. A little blood commencing to flow warned us to withdraw the needle. The lung gradually expanded whilst the fluid was being withdrawn, as indicated by the cough, and afterwards verified by auscultation and percussion. No anæsthetic was used, and the operation was the simplest in performance, only a sharp twinge of pain being felt at the moment of inserting the needle. Immediate relief followed the operation; the breathing was easier, the cough less troublesome, and purulent expectoration ceased from this date. Next day the child was better, and there was no irritation or discharge at the seat of puncture, which was seen as a mere spot, and soon entirely disappeared. The relief, however, was but temporary; for in three days (the 18th) the distension of the pleura was as great as before, and the aspirator was again employed, and a little more than a pint of odorless pus similar to the former drawn off, with relief to all the urgent symptoms.

The purulent effusion again distended the pleura, displacing the heart as much as before, but more slowly. The condition of the child was one of extreme emaciation, the limbs being apparently little more than bones covered with skin. The two aspirations having yielded perfectly inodorous pus made me unwilling to insert a drainage-tube; but, as she was evidently sinking, with the assistance of my former colleague, a trocar and canula was introduced, which gave exit to about a pint of similar pus. The opening was then enlarged, and a No. 9 Holt's winged catheter introduced. Through this a pint more, at a moderate computation, gradually drained in the next twenty-four hours. The end of the tube was surrounded by a loose pad of tenax to absorb the discharge, and this changed daily. The steady improvement inaugurated by this operation showed it to be the correct one. The child lost all its former hectic and febrile symptoms, and began to take nutriment in almost any shape in which it was offered. In the course of a week or two the appetite was ravenous, and chops and steaks were disposed of in a manner which would certainly have taxed the digestive powers of a healthy adult. Sleep became sound and refreshing, the child awaking once or twice in the night, only to ask for food. In addition to solids, large quantities of milk, and of egg and port mixture, were disposed of in the twenty-four hours. The cough and expectoration both disappeared, and in a month's time she was as plump and firm-fleshed as ever in her life. The increase in the girth of her limbs could almost be graduated daily.

Aug. 28th.—Began to take cod-liver oil emulsion, and, in addition to bark, Parrish's syrup.

At present (Oct. 20th) the discharge from the tube varies, some days being very slight, others more profuse, the weather influencing this in some measure; besides which, the house in which the patient lives is very damp. She runs about as in health, and on fine days goes into the air.

*Remarks.*—The advantage of giving free and permanent opening in empyema, at whatever age occurring, is clearly exemplified by the result of this case. The milder operation of removing the fluid by aspiration is less repugnant, especially in so young a patient; but the reaccumulation in so

short a time as three days, with its accompanying hectic, shows that it is but tentative; and on a similar case recurring I should advise drainage after a first aspiration, as giving a better chance of recovery than a repetition of the less severe operation, regardless of the state of exhaustion of the patient.

I would also say a word in favor of the simple and inexpensive bottle aspirator of Messrs. Maw and Son, which acts most efficiently. The winged catheter makes an excellent drainage-tube, though it is well to attach it by a thread secured by a strip of diachylon, as, if the wings alone be trusted to, the tube may escape (as occurred once to me), and give some trouble in its reinsertion, especially in a very young patient.

The parents will be most happy to show the child to any practitioner desirous of seeing it.

Spondon, Derby.

ON A

### NEW URETHROTOME FOR INTERNAL URETHROTOMY.

By PATRICK HERON WATSON, M.D., F.R.S.E., &c.,

Senior Surgeon to the Royal Infirmary, Edinburgh.

I HAVE no wish to enter into any consideration at present of the advantage of one method of treating stricture of the urethra as compared with another. I believe that dilatation, divulsion, external and internal urethrotomy, have each their separate sphere, and form an efficient armoury, from which a skilled surgeon will, according to circumstances, select his appropriate weapon. I wish at present merely to direct attention to a new instrument which two years ago I had constructed for the internal division of strictures of the urethra. It has seemed to me much more satisfactory than any other form of instrument, intended to effect internal urethrotomy, with which I am acquainted.

The original instrument I had constructed for me in Paris under the direction of my former resident surgeon, Mr. C. W. Macgillivray, by Luer of Paris, but as its size was too large for the treatment of very tight strictures, I had a modified instrument, upon the same principle, constructed by Mr. Young of this city. From the accompanying woodcut it will be seen to consist essentially of a Syme's stricture staff, from which a tenotomy blade is made to protrude at an angle on turning

portions of the instrument are continuous,\* a tenotomy knife-blade, concealed in a groove in the slender part of the shaft, is so pivoted that it can be projected at an angle with the commencement of the thick portion of the staff. The degree of angular projection of the knife is determined by the number of turns given to the screw attached to the handle of the instrument, and this degree of protrusion is marked by an indicator on the shaft. For the purpose of cleansing the instrument after use, the blade can be screwed out to a right angle to the shaft; but in use, when dividing a stricture, no protrusion beyond an angle of  $45^\circ$  is required. The instrument in all its parts, except the blade, is nickelled to prevent rusting.

When employed the instrument is introduced with the blade enclosed in its groove. When the pointed extremity has been insinuated through the strictured part of the canal, it glides smoothly onwards towards the bladder, till the anterior extremity of the stricture arrests the progress of the thick portion of the staff. The anterior extremity of the stricture is thus determined with absolute precision, and as few strictures exceed an inch and a half in length, the blade is sufficiently long to secure the division of the stricture with one movement of withdrawal of the whole instrument. When once the instrument has been lodged in close contact with the stricture, the screw in the handle is turned so as to secure a protrusion of the blade to an angle of  $80^\circ$ , the whole instrument is then drawn forward as if to withdraw it from the canal. When this is at first attempted it is felt to be firmly held, then the tissues yield. When the instrument has been withdrawn about two inches from the urethra, the screw is inverted, causing the blade to retreat completely into its groove, and the passage of the whole instrument onward towards the bladder is once more attempted. In most instances this is found unopposed. And if it be so, the urethrotome is withdrawn, and a full-sized catheter passed to empty the bladder. Should the passage onwards of the thick portion of the instrument be opposed, either another stricture or some portion of the same stricture is shown to be undivided. A reprotrusion of the blade, and repetition of the movement of withdrawal, will secure the division of this obstruction, and similarly of any other constriction which may still oppose the passage of the full-sized portion of the stem of the instrument.

I have never encountered any troublesome hæmorrhage in the use of this instrument, while by means of it the extent of tissue divided has always been completely under control.



from left to right a wheel fixed at the proximal extremity of the instrument. This instrument is probe-pointed at the distal extremity, and the size of a No. 10 or 12 at the haft. The instrument gradually increases for four inches from the fine probe-pointed extremity, up to the size of a No. 2 bougie. Here it abruptly enlarges to the size of a No. 12. At this point, where the thick and thin

The woodcut shows very well the appearance of the instrument with the blade protruded at an angle of about  $20^\circ$ .

The advantages which this instrument has seemed

\* The draughtsman has not done justice to his pattern, as he has not made the different sizes of the thick and slender parts of the staff sufficiently distinct, nor the transition of the one into the other as abrupt as it is in the actual instrument.

to me to present are:—1. It determines accurately the anterior aspect of the stricture, while the shaft has been insinuated through the contraction. 2. It divides the stricture from behind forwards. 3. It enables the operator, by the abrupt shoulder on the shaft, to determine whether, by the use of the cutting apparatus, the stricture has been completely or only partially divided, and admits of his completing the division if need be, without any change of instrument, by merely repeating the same steps of operative procedure, as in the first instance. 4. It limits the section of the urethra to the part or parts which are actually contracted, and does not "promenade" the whole canal. 5. Its use is attended by remarkably little pain or bleeding.

As the arrangement of the wheel and screw admits of no yielding of the blade, even in fibrous, cartilaginous, or resilient structures, in which cases I have chiefly employed it, the section of tissue is effected with absolute certainty, the gradual angle or wedge-forming position of the knife to the stem of the instrument securing that the cutting edge will act against all tissues with which it is brought in contact as the instrument is withdrawn. Neither have I found any difficulty in retiring the blade within its groove when the section is complete, the fitting of the parts securing them against the possible interposition of any portion of the surfaces of the divided soft tissues.

For strictures situated in the anterior portion of the urethra, an instrument constructed precisely in the same manner, but shorter and quite straight, is made. I find myself, however, that the ordinary curved instrument is quite sufficient for every purpose.

The cutting-blade has its edge turned towards the floor of the urethra, but it may be constructed to act upwards if so desired, or to work with a double edged knife, both upwards and downwards. I prefer myself that the incision should be made only in one direction, and that downwards or towards the floor of the canal.

Fainburgh.

## CASE OF MEDIASTINAL TUMOUR.

By THOMAS COLE, M.D., M.R.C.P.,

Physician to the Royal United Hospital, Bath.

I AM indebted to my friend and house-physician, Mr. Field, for most of the notes of the following case.

William I—, aged fourteen, a traveller, was admitted into the Royal United Hospital, Bath, on Aug. 9th, 1875.

*History.*—With the exception of being in a London hospital some time since, for some weeks, he gives no account of illness till three weeks ago. He then had an eruption on the right lip, with a barking cough. A week afterwards he ran, in the early morning, after a stray horse, and fell down all bathed in perspiration. A week ago he was wrestling with a playmate, when he suddenly became breathless, but felt no pain. Since that time the breathing has been so difficult that he could not lie down in bed; last night he could not go to bed at all. He has been very thirsty for three weeks, with a bad appetite and confined bowels.

*Present condition.*—Respiration most painfully labored, not much quickened; slight cough; tongue furred; no marked blueness of face; heart apparently healthy. Dulness at right lung-apex anteriorly, and at posterior left base; at the latter spot tubular breathing; on both sides anteriorly, except at the extreme left apex, the breathing is very indistinct, very little air seeming to enter the chest. Expiration prolonged everywhere; no crepitation nor rhonchus. Liver two inches below the costal margin; spleen not enlarged. Temperature at 9 p.m. 99° Fahr.; respiration 82; pulse 184. Ordered, three grains of carbonate of ammonia, half a drachm of compound camphor tincture, and ten minims of tincture of squill, to an ounce of water, every four hours.

Aug. 10th.—Temperature 98·6°; respiration 83; pulse 122, small and weak. Passed a dreadful night, wanting to get in and out of bed; orthopnea; face bedewed with perspiration; lips somewhat blue; external jugulars swollen, the left more than the right; superficial veins on the right side of the chest prominent and enlarged; tenderness over this part; much heaving of the chest on inspiration; a few small cervical glands enlarged; total dulness in the right anterior chest, including the sternal region; but little movement; nearly the same on the left side; fremitus diminished, except at the lower right half; vocal vibration diminished. Right chest posteriorly: a tympanic note everywhere except at a point behind the infra-axillary region, where there is dulness; loud blowing breathing all over. Left chest posteriorly: hyper-resonant superiorly; dull, with a tympanic modification, below; vocal fremitus much diminished below, somewhat increased above. Tubular breathing heard generally, with a little small crepitation. The diagnosis now arrived at was, that the patient was suffering from a tumour in the anterior mediastinum, malignant in its nature, and probably of a lymphadenomatous character. Evening: temperature 99·6°; respiration 36; pulse 136; urine acid, sp. gr. 1027, loaded with pink and white lithates, no albumen.

11th.—Morning temperature 98·4°; respiration 80; pulse 124; very bad night; constant orthopnea; temperature, according to the nurse, was 103° at 8 a.m.; tongue much coated; sweating profusely; takes scarcely any food; no excess of white blood-cells.—Evening: Temperature 100·4°, respiration 40, pulse 142. Ordered ten grains of chloral.

12th.—Temperature 98·6°, respiration 36, pulse 140; slept about two hours after a second dose of chloral; no improvement; there was evidence of a larger accumulation of fluid in the pleural cavities.—Evening: Temperature 99·4°, respiration 40, pulse 146. Death somewhat suddenly ended the poor lad's sufferings the same night.

*Post-mortem examination.*—On opening the chest a large quantity of serous fluid escaped from both pleural cavities; on the right side it was confined to the anterior two-thirds of the chest by old firm adhesions, and the lung was bound down in a carnified state at the back; on the left side the carnified lung floated freely in the fluid. The lungs were free from growth, except a few white grains on the pleural surface. Beneath the costal pleura, and situated over the ribs, were masses of new growth; these were at the posterior part of the chest, and quite removed from the main mass which filled the anterior mediastinum. Micro-

scopically, they consisted of lymphoid tissue. A very large and somewhat irregular mass filled the anterior mediastinum; it was adherent to the sternum, ribs, and diaphragm, and encroached a little more into the left chest than the right. The trachea and œsophagus ran down behind it, without being constricted. The tumour was firmly and intimately united with the outer layer of the pericardium. This contained a quantity of dark bloody-looking fluid. There was no growth from its serous surface. The heart, which was pushed somewhat backwards, had a few small pieces of hard white substance on its surface, which consisted of fat and lymphoid tissue. The liver and spleen were healthy, but the kidneys contained several large round masses of white growth. No other glands beyond the mediastinal were implicated. The mediastinal tumour presented all the microscopical characters of a lympho-sarcoma.

Bath.

I have exhibited, from time to time, at meetings of societies, patients submitted to operation by this

FIG. 1.

### A USEFUL METHOD OF EXCISION OF THE ELBOW-JOINT.

By C. F. MAUNDER, F.R.C.S.,

Surgeon to the London Hospital.

It is scarcely necessary to suggest that, in performing an operation, the local consequences should be kept prominently in view. To know the result of an operation some years subsequent to its performance is the best way of appreciating its merits, and must be my excuse for publishing extracts from a letter which I have just received from New Zealand, from a gentleman whose right elbow-joint I excised about six years ago.

*"From J. N.—, Hereford-street,  
Christ-church, New Zealand,  
August 5th, 1876.*

*"DEAR MAUNDER,—You will be glad to learn that my arm has won the champion billiard cue in the late match here; also that I took second honors in quoits. I send you a paper per post. .... I have left a clause in my small will that my arm shall be preserved and sent to you for examination and dissection after my death. I believe it to be the finest arm in the world without a joint. Yours truly,*

*J. N."*

The case was one of very severe compound comminuted fracture of the ends of the bones forming the right elbow-joint, and to which I was called by Dr. Floyer, of Bishopsgate. I performed excision on a method which I suggested to the profession as a *certain* means of securing active extension by the triceps—a desideratum hitherto only rarely, and then accidentally, attained. Briefly put, my object is arrived at by avoiding all transverse section of the soft parts lying between the point of the olecranon and the external condyle of the humerus. In this way the continuity of muscular and aponeurotic structures passing from the arm to the forearm is not destroyed,

method of mine,\* and all who saw them were surprised by the amount of the power of extension

FIG. 2.

which was thus secured. Mr. Steele, of the Bristol

\* Maunder's Operative Surgery, second edition, p. 126.

Infirmiry, has both practised and published his approval of the method.

Fig. 1 shows a left arm immediately after the performance of the operation; the hook sustaining the structures which are to be carefully preserved.

Fig. 2 is a sketch of the arm of J. N—, taken three years ago, and three years subsequent to operation. The forearm is in the position of active extension by the triceps. He could then play billiards, quoits, and use "the gloves" with facility.

Queen Anne-street, W.

ON

## FIFTY CASES OF HÆMOPTYSIS TREATED WITH ERGOT.

By JAMES M. WILLIAMSON, M.D. Edin.,

Resident Medical Officer Royal National Hospital for Consumption, Ventnor, Isle of Wight.

ABOUT eighteen months ago, after reading the papers written on the subject by Dr. Anstie in the *Practitioner*, I commenced making a fair trial of the value of ergot in the treatment of hæmoptysis. The success which followed its administration was so encouraging that I gave the drug in every case of hæmoptysis which I was called upon to treat, and I now propose to state briefly the results of its use in fifty cases.

The fifty patients were suffering from phthisis in different stages, and the amount of the hæmorrhage varied from abundant bright streaks on the sputa to the expectoration of several ounces of blood. As the cases all occurred in hospital practice, very little time was lost between the advent of the hæmoptysis and the exhibition of the remedy. The ergot was invariably given by the mouth and in the form of the liquid extract. Much has been said about the success of the subcutaneous injection of ergotin and its superiority to this plan, but since there was no difficulty in any of the cases in administering a draught, and as the drug acted in most instances with a promptitude which was sufficiently satisfactory, the hypodermic method was not employed. Forty-minim doses of the liquid extract may be given twice within the first hour, and, guided by the results, at least every two hours afterwards, the dose being diminished and given less frequently as the hæmorrhage subsides. I have never observed any disagreeable effect follow even upon the administration of large quantities within short periods, but, as a general rule, if four or five full doses make no distinct impression upon the hæmorrhage, the remedy should be abandoned for another. Care should be taken to use a fresh and sound preparation of the ergot.

Out of the 50 cases, the drug rapidly checked all bleeding in 44 instances. Of these 16 were women and 28 men, and in at least one-fourth of the number the hæmoptysis merited the term profuse. In 40 of the 44 cases it was the first and only remedy given; in 2 others it was successful after a mixture containing gallic acid, alum, and dilute sulphuric acid failed; in another it was effectual after acetate of lead with opium proved useless; while in the

remaining instance it repressed the bleeding after both of these plans were unavailing. The ergot was ineffectual in 6 cases, and of these it may be well to give some particulars. Case 1 was that of a middle-aged widow, who had had several violent hæmorrhages. On this occasion it was very copious, and repeated doses of ergot, given in rapid succession, produced no perceptible abatement; gallic acid was then substituted, but just as it was making a decided impression it gave rise to such gripping pains in the abdomen that it had to be given up; ergot was resumed, and the hæmorrhage rapidly ceased. Case 2 was that of a young man in whom the hæmoptysis was moderate; it was unaffected by ergot, but yielded to gallic acid. It is only right to add that in this case there was some doubt as to the goodness of the sample of ergot used. Cases 3 and 4 were two examples of a slight, but very chronic and obstinate hæmoptysis, in which the sputa had a uniform pink tinge. In one of the men, gallic acid succeeded after ergot proved a failure; in the other, gallic acid, ergot, acetate of lead with opium, perchloride of iron, ammonio-sulphate of iron, the mineral acids, and oil of turpentine, were all successively tried without avail. Case 5 was that of an unmarried woman, aged twenty-five. She had had many previous attacks. Ergot proved ineffectual, and was replaced with success by acetate of lead and opium. Case 6 was that of an unmarried woman, aged twenty-three, who had also had frequent previous hæmorrhages. On this occasion the bleeding was profuse, and resisted both ergot and gallic acid; oil of turpentine eventually subdued it.

The cases in which ergot failed have been stated somewhat fully, partly to show that, in at all events three of the number, it shared the failure in common with gallic acid, the remedy which is probably most frequently employed in the treatment of hæmoptysis. Over gallic acid ergot has the distinct advantages of never causing gripping or constipation, and more especially of not interfering with a liberal use of milk. The large proportion—equivalent to 88 per cent.—of the cases in which ergot succeeded, not only testifies to its great value and claims for it our confidence, but also strongly justifies the recommendation that it should be the first drug tried in all cases of hæmoptysis.

Ventnor, I.W.

## ON THE TREATMENT OF ALVEOLAR ABSCESS.

By ISIDOR L. LYONS, M.R.C.S., L.D.S.

ALVEOLAR abscess is the result of an acute inflammation of the periodontal membrane. This may arise from various causes. It is commonly the sequel of acute inflammation of the pulp of a tooth, but it may commence in the membrane. An alveolar abscess generally points opposite to the buccal or labial surface of the affected tooth, or the pus may exude at its neck or travel along the hard palate and open at any point internal to the dental arch.

Among the different local remedies prescribed for this affection, the most common are external

fomentations and poultices. This treatment is to be deplored for the following reason. When, for example, an abscess takes place at the root of an upper bicuspid tooth, and the swelling is at its buccal surface, on a poultice being applied externally, pus would travel above the fold of mucous membrane connecting the superior maxilla with the cheek, and appear among the buccal muscles, ultimately passing through the skin, thereby producing those ugly scars often seen on the face of patients who have undergone this treatment. The following cases are typical of these results.

Isabella B—, aged twenty-eight, admitted into St. Bartholomew's Hospital April 1st, 1875, under the care of Mr. Callender. This patient had suffered great pain for a long time from a carious lower molar, at the roots of which there had been an abscess. This had been treated by external fomentations and lancing of the gum. When admitted into the hospital, there was a soft red spot with two or three openings over the middle of the lower jaw, on the right side, extending behind towards the angle and ramus, and slightly down to the neck. There was also inability to open the mouth except to a very slight degree. The first lower molar was reduced to a stump. Since admission, the swelling behind and below has increased, and apparently suppuration taken place. On April 9th the right lower molar (which was necrosed) and the fangs of the two other teeth were extracted. On the 16th the abscess appeared to be discharging through openings in front of it. As regards the rest of the history of this patient, an attack of erysipelas supervened, involving both sides of the face, and which was remarkable for its severity and high temperature. On June 16th she was discharged, her general condition much improved.

Emily C—, aged twenty-four, admitted as an out-patient of the hospital April 8th, 1875, under the care of Mr. Coleman. This patient had acute periodontitis of the first left upper molar in the previous March, and was ordered to apply poultices externally. Within a week the abscess burst. In April she came to the hospital to have the tooth extracted. At that time the scar extended from that part of the cheek opposite the zygomatic arch to midway between it and the angle of the mouth.

G. S—, aged twenty-one, admitted as an out-patient on March 21st, 1875, under the care of Mr. Coleman. This patient had suffered from acute periodontitis of a left lower molar for one month; and, an abscess supervening, it was treated by external fomentations and poultices. At present there is a fistulous opening in the cheek.

The appropriate treatment in the above cases would, no doubt, be the immediate extraction of the offending teeth; but if desirous of saving them, by internal fomentations (the patient to be desired to bathe his mouth frequently with water at as warm a temperature as possible), also by lancing the gums and the application of leeches, and, when an abscess has formed, by free incisions.

The cases given are types of a very large number of out-patients seen at the dental department of the hospital.

## OPHTHALMIC MEMORANDA.

By EDGAR A. BROWNE,

Surgeon to the Eye and Ear Infirmary and the Dispensary for Skin Diseases, Liverpool.

1. A CASE of partial staphyloma corneæ afforded an opportunity for trying a method of treatment which I do not remember to have seen previously employed.

C. S—, workman, St. Helens, having neglected a gonorrhœal ophthalmia of the right eye, was first seen when a large sloughing ulcer of the outer and lower third of the cornea was threatening perforation. Although the eye was rescued, a large staphyloma resulted. The protuberance was exceedingly unsightly, and gave rise to inconvenience by preventing closure of the lids. As useful vision upwards and inwards remained, the only ordinary method available seemed to be repeated paracentesis with pressure. But, considering how often this plan fails to do good even in small staphylomata, I resolved to imitate a process now in vogue for conical cornea, and operated (May 7th) by transfixing the most prominent portion of the tumour with a Graefe's knife. The incision was an eighth of an inch long, parallel to the long axis of the swelling, and obliquely inclined to its surface. The flap was seized with the iris forceps, and a tiny wedge-shaped piece was snipped off by the scissors. Firm pressure was then applied. I felt very doubtful of the capacity of the degenerated tissue for healing, and was delighted to find that the posterior edges of the wound had, in twenty-four hours, healed as readily as healthy cornea. The wound having completely cicatrised, though but little flattening had resulted, I again (May 28th) excised a wedge-shaped piece of tissue, about an eighth of an inch long and a line across at its widest part. This healed readily, and produced a marked improvement. On June 18th I excised a third piece with like favorable result. When cicatrization was complete the staphyloma was considerably flattened (though not quite level with the normal surface of the globe), and the lids closed easily and comfortably.

The main points conducive to success seem to be, that the posterior edges of the wound should be in apposition, and that a large piece of tissue be not removed at one sitting. As the operation is nearly painless, it might be repeated a dozen times if necessary.

2. Wound of an ocular muscle without injury to the globe is necessarily a rare and curious accident. The following is the only case I have ever seen.

J. K—, iron-roller, St. Helens, was hit by a flying fragment of metal between the lower lid and the globe, neither of which, strange to say, was injured. He applied at the infirmary some weeks after the accident on account of vertical diplopia. On inspection, an upward squint was manifest, and the power of downward movement was considerably impaired. At the bottom of the retro-tarsal fold was an irregular cicatrix, and the lower part of the ocular conjunctiva was red and much thickened. On June 11th I operated by snipping a free horizontal opening in the conjunctiva, about an eighth of an inch from the corneal margin. The tissues were matted together, but by careful employment of scissors and



hook the attachments to the globe were freed; the tendon remaining joined to the conjunctiva. The superior rectus was now divided, and the lower tendon brought forward by three silk sutures, which were drawn sufficiently tight to give the eyeball a slight downward inclination. The wound healed readily; but when the superior rectus regained its power the improvement was found to be only partial, and I therefore (August 6th) brought the inferior rectus still further forward by a second operation, but did not again divide the superior tendon. The pupil was at first half its diameter lower than its fellow, but after the withdrawal of the sutures it gradually rose till it was level. The patient was discharged cured.

Liverpool.

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ON A CASE OF

ANEURISMAL TUMOUR OF THE PHARYNX.

By JOHN J. BARNES, M.R.C.S.

I beg to call attention to the following interesting case.

B. N—, aged seventy-three, a female patient of mine, had complained of slight difficulty in swallowing. On looking into the throat I found it natural, with the exception of a small pulsating tumour, situated at the back of the pharynx, between the median line and the right posterior pillar of the fauces, but nearer the latter. It is about an inch in length and half an inch in width, the upper end being opposite the lower edge of the soft palate. The pulsation of this tumour is entirely arrested by very moderate pressure over the external carotid. Partly, no doubt, from the difficulty of getting a good *point d'appui*, it cannot be arrested completely by such pressure as my patient can bear over the common carotid.

Cases have been recorded by Porter and Syme of aneurism of the internal carotid "pointing" in the above situation. I think, however, from the extreme ease with which the pulsation is arrested in this case by pressure over the external carotid, that it is more likely to be an aneurism of the ascending pharyngeal branch of that artery. It is of course open to anybody to maintain that the pressure with which one arrests the pulsation is conveyed through intervening structures to the internal carotid. I can only reply that the pressure required is so moderate that it seems doubtful whether it would be sufficient to stop the flow through the internal carotid, considering its depth from the surface. There are no pressure signs; the pupils are equal; there is no alteration of voice; no dyspnoea. The only complaint is of occasional slight discomfort in swallowing, which amounts to very little. There is no evidence of aneurism elsewhere.

Considering the age of my patient, and that the tumour has not materially increased during the last three months, I do not feel justified at present in tying the common carotid. If the aneurism should increase, I think it would be right to give digital pressure a trial. In the event of any bleeding coming on, the patient's friends have been instructed how to compress the external carotid,

which they can do perfectly. Tying the common carotid would then, I presume, be the only resource.

Bolton.

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## A Mirror OF HOSPITAL PRACTICE, BRITISH AND FOREIGN.

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Nulla autem est alia pro certo noscendi via, nisi quamplurimas et morborum et dissectionum historias, tum aliorum, tum proprias collectas habere, et inter se comparare.—MORGAGNI *De Sed. et Caus. Morb.*, lib. iv. Proœmium.

### LONDON HOSPITAL.

#### SEVERE CASE OF IODISM; TRACHEOTOMY.

(Under the care of Dr. FENWICK.)

THIS case of iodism, for the notes of which we are indebted to Mr. Roland Smith, resident medical officer, is one of the most remarkable hitherto recorded, and presents many points of interest. The patient was evidently unusually susceptible to the influence of the iodide of potassium, and suffered alarming symptoms from the effects of the drug, notwithstanding its combination with bicarbonate of potash, which, it has been stated, diminishes greatly the risk of iodism. The dose (ten grains) of the iodide was undoubtedly a large one to commence with, and is sufficient to give rise to disagreeable symptoms in most persons. It is the custom with many of those who are in the habit of using this drug largely to begin with small doses of three or four grains, gradually increased. By this means patients may often be made, in time, to take very large doses without any inconvenience whatever, although they showed at first an intolerance of the drug when given in full doses. Among the other circumstances worthy of note in this case was the absence of purpura or other cutaneous manifestations in the legs. In several cases that have come under our notice the walls of the hair and sebaceous follicles of the legs were the chief or only portions of the skin affected.

Frederick R—, aged thirty-five, was admitted to the hospital at 9.30 A.M. on the 9th of October in a semi-comatose condition. His face was swollen and deeply congested, and the eyelids were puffy and red, as in an exaggerated case of facial erysipelas. The lips and tongue were extremely livid, the tongue being swollen and protruding from between the teeth. Very little air entered the lungs, and the epigastrium and intercostals sank in with each inspiration. There was croupy breathing, and on one occasion the cough was typically laryngeal. The pulse was scarcely perceptible. There was no dulness on percussion at the upper part of the sternum, no palpable interclavicular pulsation, and no bruit or other signs indicative of an aneurism pressing on either the trachea or the recurrent laryngeal nerves. Feeling

certain that the obstruction was laryngeal, and noticing that the respiratory power was failing, Mr. Job, the house-surgeon, performed tracheotomy to prevent death, which seemed inevitable. The operation was not done a moment too soon, for breathing had ceased and the patient was pulseless for nearly a minute before the termination of the operation; but artificial respiration for a few seconds sufficed to restore life, and, before five minutes had elapsed, the patient expressed himself as much relieved. Color returned to the lips and tongue, a good pulse was felt at the wrist, and the respiration seemed quiet and unimpeded. Without further examination at the time, the patient was sent into the ward.

At 12 o'clock, when seen by Mr. Smith, some pustules were observed on the face, and a papular eruption on the back of the hands and flexor aspect of forearms, the abdomen, chest, and lower extremities being exempt. At the back of the neck there were three pustules, and several on the ears. The patient was at this time breathing quietly. The temperature in the axilla was  $99.4^{\circ}$  Fahr.; pulse 100; respiration 36. There was no lividity of face, the eyelids were less swollen, no pustules on conjunctivæ, but very great chemosis. Owing to the umbilicated appearance of some of the pustules, the man was at once isolated. There had been no rigor, no pains in the loins, and no vomiting; but there was considerable headache.

The patient's previous history, as given by his wife, was as follows. Three years ago the patient had two similar attacks, and for each was treated in the London Hospital. On those occasions the breathing was not affected, but the throat was slightly sore. The eruption was confined to the nose, eyebrows, and forearms. Iodide of potassium was supposed to have been the cause of each, as that drug had been taken on both occasions. Excepting for rheumatism, he remained well until three months ago, when he became the subject of kidney disease (acute nephritis?). For the past month he has felt languid, and sometimes been obliged to give up work on that account. On Oct. 7th he woke up with rheumatism in his left wrist and a pain in the cardiac region. He got the following medicine from a medical man whom he consulted: "ten grains of iodide of potassium, ten drops of tincture of digitalis, fifteen grains of bicarbonate of potash in water, to be taken three times a day." Six doses only were given. After the fourth dose he thought he had caught a violent cold, and went to bed. He continued the medicine. At 1 o'clock on Saturday he woke up with a sensation of choking, called his wife, and tried to tell her he should choke; he could scarcely articulate. Poultices externally and inhalations of steam gave no relief. A neighboring medical man was consulted at 9 o'clock, and his immediate removal to the hospital recommended. The patient was vaccinated when a child. Fifteen years ago he had small-pox; no history of syphilis could be obtained; family history was good; no similar illness or rash has occurred in anyone living in the street or neighborhood where the patient resides.

Oct. 10th.—10 A.M.: Temperature  $102.4^{\circ}$  F.; pulse 130; respiration 21. 10 P.M.: Temperature  $102.8^{\circ}$ ; pulse 136; respiration 24. On his face there were several pustules, some of them closely resembling variola of about the eighth to the tenth day. The eyelids were still swollen and oedematous, and there were spots also on his ear, hæmor-

rhagic-looking, and evidently containing bloody serum; others on his ears were much smaller, and did not contain pus, but were simply papules. There were three pustules on the back of the neck, none on the abdomen, chest, back, upper arms, or lower extremities, but a great number on the forearms, and in this situation the different varieties were very well marked. Some pustules were large and umbilicated, others not umbilicated, and varying in size so as in some places to resemble a simple papular eruption. The uvula was elongated, and the mucous membrane was somewhat swollen as if oedematous, but there was no eruption on the palate or pharynx. Urine copious in quantity, sp. gr. 1008, acid, albuminous, 1.4 per cent. of urea, and gave the characteristic reactions of iodide of potassium solution.

11th.—The tracheotomy tube was removed after forty-eight hours, as the patient could by that time breathe quietly through the natural passages. Soon after removal a quantity of adhesive mucus was expectorated through the wound and some by the mouth. Temperature  $102.2^{\circ}$ ; pulse 104; respiration 24. The pustules on the face had commenced to scab; most on the forearms had a reddened areola, especially the umbilicated ones. Some of the papules were fading; nothing could be seen on palate or uvula. Laryngoscopic examination showed slight congestion of epiglottis and vocal cords. Urine still contained traces of iodine. Evening temperature  $101^{\circ}$ .

12th.—No fresh spots. The larger pustules had by this time commenced to dry up. The contents of the pustules seen microscopically consisted of squamous epidermic scales, pus-cells, and a great quantity of small spheroidal, transparent, non-nucleated cells, about the 1-6000 or 1-7000 inch in diameter. Although the urine was still albuminous, it did not contain any iodine. Morning temperature  $100^{\circ}$ ; evening  $99^{\circ}$ .

13th.—Temperature normal. Rash almost disappeared, excepting one or two pustules which had burst and continued suppurating and discharging.

14th.—Patient convalescent. Urine still contained a trace of albumen.

Nov. 2d.—Patient discharged quite well.

#### CASES OF FISTULA IN ANO.

(Under the care of Mr. MAUNDER.)

We are indebted to Mr. J. Job, house-surgeon, for this report of some severe cases of fistula in ano.

CASE 1.—M. A. W.—, about twenty-four years of age, a married woman in fair health, was found, on examination, to be affected with a fistula in ano on both sides of the anus. Mr. Maunder treated one fistula in the usual way by incision with the knife, and to the other he applied the elastic ligature. The operations were performed on March 10th, 1875. On the twenty-third day after the operation the knife wound was found to be healed; but not until the sixty-first day subsequent to operation was the ligature wound cicatrised. During the first few days a good deal of pain was felt at the seat of ligature, which came away, as it is shown in the drawing, on the tenth day. The little rounded head with a depression in the centre originally enclosed the tissues to be divided.



CASE 2.—J. H.—, aged thirty-three, admitted

May 8rd, 1875, with a fistula on the right side of the anus. On examination it was found to be about five inches in length, but with an intervening opening just within the sphincter. The most accessible portion of the fistula was laid open with a bistoury, while the rest of it was cut up with a pair of common scissors, the pointed blade of which traversed the canal, guided by a director, the bowel being protected from the second blade, and the progress of the operation ascertained by the left forefinger introduced into the rectum.

During the progress of the case a small abscess formed in the buttock, towards the perineum, which required evacuation. Notwithstanding this complication, and the great length of the sinus, the patient made a good recovery, and has remained well.

**CASE 3.**—E. M.—, sixty-five years of age, admitted May 21st, 1875, was also the subject of a fistulous opening on the right side of the anus. On examination, a very long fistula was found, passing to the left of the vagina, and apparently terminating behind and on the left side of the symphysis pubis. No bare bone could be detected. An intervening opening into the rectum just within the sphincter existed.

Mr. Maunder declined to lay open so extensive a fistula, and explained to the patient that he could not undertake to cure her absolutely, but might be able by operation to prevent the constant discharge at the external orifice of the fistula, which was in itself a great source of annoyance and discomfort. He proposed to lay open that portion of the sinus which existed between the external orifice and the opening just within the sphincter; leaving the rest of the sinus to empty its secretion into the bowel, to be discharged at stool.

The desired object was attained by the operation.

## ST. THOMAS'S HOSPITAL.

### CASE OF HYDROPHOBIA.

(Under the care of Mr. SYDNEY JONES.)

A POINT of interest in the following case, for the notes of which we are indebted to Mr. H. P. Potter, house-surgeon, was the benefit derived from the inhalation of chloroform. Although the case unfortunately proved fatal, the chloroform gave considerable relief.

Henry W—, aged twelve, a very healthy boy, rather hot-tempered but not nervous, applied at the hospital on September 24th, at 1 P.M., suffering from symptoms of hydrophobia. He had had no previous illness. The boy stated that six weeks ago, while stroking a dog which was chained, the animal snapped, and caught hold of his right little finger, and he had to pull it forcibly out of its mouth. No one else was bitten. The dog was killed two days after, and was said to be suffering from rabies. The finger was simply bound-up in rag for two days, when he came to the hospital, and poultices were ordered. The wound healed in about a fortnight. During the interval the boy was pretty well, but sometimes he was rather strange in his manner; never spoke of fear of hydrophobia. On the evening of the 19th September he was taken with rigors, and complained of pain shooting up the right arm from the bitten

finger; nothing amiss was noticed about the wound. The boy went to bed at once, and passed a restless night. The next morning he was better; ate and drank well. On the 21st he began to refrain from food; said he would take it "by-and-by." On the 22nd spasms were first noticed, when he drank fluids. Since the night of the 20th he had not slept; had been very hateful; had had illusions, and frequent and copious micturition. The spasms and restlessness increased up to the day of admission, on the morning of which he foamed at the mouth. He had no aversion to animals, and he caressed the cat just before leaving for the hospital.

On admission at the Casualty department the patient had a most anxious and woful expression, gasping for breath like a child after a fit of crying; at each inspiration the angles of the mouth were drawn downwards and the eyes opened. The face was pale and cold. There was an old cicatrix at end of right little finger; nail not quite renewed; no redness nor tenderness about it. Pain shooting up right arm and down the right side. Bowels were said to have acted freely after some jalap powder on the 20th.

The patient was admitted into Edward small ward. At 3 P.M. was seen by Mr. Jones. Appeared in a state of great nervous excitement, but at intervals could answer questions rationally. On the least excitement, as of drawing bedclothes up or down, or when spoken to quickly, the muscles of the face and neck were spasmodically affected, the chin thrown up, and angles of mouth drawn down. On trying to swallow fluid (to which he had strong aversion) the spasms were most intense; he gargled, and at last swallowed part of the liquid, while part was expelled by the mouth. Pulse 88, quiet; temperature 101° 2'; skin warm; feet comfortably warm. No pustules nor enlarged glands seen beneath the tongue. Five grains of calomel in glycerine, and the sixth of a grain of the extract of belladonna every four hours. Hot bottles to feet.—4 P.M.: About the same. Said he saw a big dog on the ceiling. Answered rationally but refused fluids and ice. On bringing an ice-bag in contact with the head intense spasms were excited. Pulse risen to 140.—At 10 P.M. Mr. S. Jones saw the patient, as he was much worse. He raved and was greatly excited if looked at fixedly; spasm more or less at each inspiration; answered questions, but angrily; pugnacious, tried to bite and scratch bystanders. Bowels acted freely after turpentine enema. Pupils fairly dilated; perspiring. Temperature risen to 102°; pulse 130 to 140; respiration 24. Chloroform inhaled with most marked effect; instant relief. As soon as insensibility was produced, he breathed tranquilly, the inspiratory spasm being entirely lost; slight tracheal rhonchus, as of mucus. Mr. S. Jones then determined to keep patient under the influence of chloroform, and gave an enema of fifteen grains of bromide of potassium, with ten of chloral hydrate, every four hours. 11 P.M.: Respirations at long intervals, and gasping. He neither moved nor spoke. Previous labored breathing became quiet. Pulse accelerated, and slightly stronger. Appearance tranquil. Temperature 101°; pulse 130.—11.45 P.M.: Chloroform given with Clover's apparatus for two hours, but left off on account of accident with bag. Warm bricks retained in bed, and patient packed with blankets. Ice applied to nape of neck

brought on spasms and general disquietude.—Midnight: Nutrient enema, with half an ounce of brandy, fifteen grains of bromide of potassium and ten of chloral hydrate, given and retained. Chloroform kept up. Abdominal muscles rather tense. Thoracic breathing, with great uplifting of trachea. Feet and hands comfortably warm.

Sept. 25th.—1 A.M.: Patient allowed to recover sensibility for a short time. He sighed very much, tossed his head from side to side, and threw his left arm about. Temperature 101°.—1.30 A.M.: Chloroform still used. Patient appeared more exhausted. Breathing slower and less deep; extremities warm; pupils moderately contracted.—4.30 A.M.: Fully under chloroform. Tracheal rhonchus; skin hot and dry. Temperature 102.8°; pulse 160; respiration 42. Had not passed urine since admission. Bladder not distended; eyes congested.—4.45 A.M.: Enema of fifteen grains of bromide of potassium, ten of chloral, and half an ounce of brandy; eggs and beef-tea.—5 A.M.: Subcutaneous injection of one-sixth of a grain of morphia. Chloroform administered for about half an hour after the morphia injection, when the pupils were contracted to the size of a pin's head. He then seemed fully under the influence of morphia, and no chloroform was required till 6.30, when he came to, and the spasms at each inspiration recommenced. Chloroform repeated.—6.30 P.M.: Temperature 102.6°; pulse 120, very soft and feeble; respiration 26. Rhonchus all over the front of the chest. Face congested; eyes half opened and turned upwards; skin dry and warm. Had not passed water nor motions. Bladder not distended; abdomen tympanitic; hands blue.—7.20 A.M.: Died. Before death the tracheal rhonchus became more and more marked; lividity of hands and feet correspondingly increased. During the last fifteen minutes of life the inspirations became irregular; the inspiration prolonged, accompanied by much rattling in the larynx. Artificial respiration kept up for ten minutes. Pupils widely dilated. Thermometer introduced into the right axilla ten minutes before death, 101.7°. Respiration ceased at 7.20, though the heart's action continued for some short time after.

*Autopsy, fifty hours after death.*—Body much decomposed. Results mostly negative. Brain congested. On section, the grey matter, both external and internal, was unusually distinct and congested. Numerous vessels in the white substance. Internal organs congested; tongue congested.

## BIRMINGHAM AND MIDLAND HOSPITAL FOR WOMEN.

CASE OF OVARIAN TUMOUR SIMULATING EXTRA-UTERINE PREGNANCY, WITH COMPLETE EXTRUSION OF UTERUS AND BLADDER; SUCCESSFUL OVARIOTOMY AND CURE OF THE EXTRUSION.

(Under the care of Mr. LAWSON TAIT.)

H. L—, a handsome brunette, aged eighteen, had menstruated regularly from the age of thirteen until twelve months ago, when the catamenia suddenly ceased, and the abdomen began to enlarge. In February last she was seen by several practitioners, who all pronounced her to be pregnant, and in a letter from one of them it is stated that she had morning sickness, irritability of the bladder,

darkened areolæ, and that the writer was positive he had felt movements and heard the fetal heart. At the end of June she had what seemed to be the expulsive pains of labor; but, as the uterus was found to be virginal, and to be completely extruded from the vulva, it was supposed that the pregnancy was extra-uterine. In the beginning of July she consulted Mr. Tait, who diagnosed an ovarian tumour, multicystic, and advised its removal. Between his first and second visits one of her attendants communicated the facts of the history given above, and they were enough to make Mr. Tait hesitate in his opinion, until he had examined her under ether. The more complete examination confirmed his previous opinion, and on August 18th he removed the tumour. The cysts were so numerous that the mass was practically solid. The pedicle was very long, broad, and triangular in shape, extending from the cæcum upwards and inwards to the tumour, and downwards and inwards to the extruded uterus. In order to cure the displacement of the pelvic organs at the same time that the tumour was removed, Mr. Tait pulled the inner part of the pedicle as far up as he could, and clamped it close to the right ureter.

The patient recovered without a single bad symptom, began to menstruate on the 5th of September, ceased on the 9th, and went home on the 10th with the uterus and bladder in their normal positions.

## SAECULAR DILATATION OF THE URETHRA; REMOVAL; CURE.

(Under the care of Mr. LAWSON TAIT.)

Mrs. B—, mother of a large family, had suffered for many years from a protrusion about the size of an egg from the vulva, which was excessively painful. She passed large quantities of fetid pus from the bladder. The protrusion looked like an ordinary cystocele, save that it was quite irreducible, was very hard, and when firmly pressed a large quantity of fetid ammoniacal pus escaped from the orifice of the urethra. If this pus got on the finger, it made them smart. The sound readily passed into the cavity of the protrusion from the urethra. It was clearly, therefore, not an ordinary cystocele, but probably a sacculation of the urethra, and the only benefit likely to be obtained was by its removal. She was placed under ether, and the lower half of the protrusion was removed by a cut of the scissors, and this opened into a large cavity lined with thickened corrugated mucous membrane. It had an opening into the urethra large enough to admit a No. 9 or 10 catheter, the opening being situated in the lower wall of the urethra, and about half way between its orifice and the entrance to the bladder. The whole of the mucous lining of the sac was removed, and the vaginal mucous membrane was closed over the cavity by deep sutures. The wound healed rapidly and the cure is now complete.

Mr. Tait remarked that he had never met with a case like this, and he supposed that the sac must have been of congenital origin.

## REMOVAL OF A LARGE SOFT FIBRO-MYOMA BY ABDOMINAL SECTION; DEATH.

(Under the care of Mr. LAWSON TAIT.)

Mrs. W—, aged forty-five (sent by Dr. Eshelby,

of Stroud), had been aware of an increase in size for about four years, but chiefly within the last few months. Mr. Tait saw her first at the end of July, and found a large semi-fluctuating tumour reaching up to the xyphoid cartilage, lying chiefly to the left side, but with a well-defined secondary mass lying under the liver. There was a good deal of ascites. The tumour moved very freely. The uterus was high, and moved with the tumour, but not closely enough to make it certain that it was not ovarian. Mr. Tait expressed a doubtful opinion about the nature of the tumour, but advised an exploratory incision, and the removal of the tumour if it were possible. The incision was accordingly made on Sept. 11th, and, even when the tumour was bared, it was not till a needle had been passed into it that its non-cystic nature could be definitely ascertained. The tumour was free from adhesions, and had a fair-pedicle. Mr. Tait therefore removed it and placed a clamp on the pedicle. The tumour was found to be a collection of extremely soft fibroids growing in the fundus uteri, which was of course removed with them. The patient went on well for thirty-six hours, but died of general peritonitis on the fourth day.

This is the second case of the kind that Mr. Tait has operated on, the first having recovered.

#### KING'S COLLEGE HOSPITAL.

##### OPERATIVE INTERFERENCE IN CASES OF CLEFT PALATE.

(By Sir WILLIAM FERGUSSON, Bart.)

INSTEAD of stripping muco-periosteal flaps from off the hard palate, after the plan of Mr. Avery and Langenbeck, and bringing them together in the middle line so as to close the opening, Sir William Fergusson detaches a piece of bone on each side of the cleft, and then forces the bone, periosteum, and mucous membrane towards the middle line and fixes them there. The steps of the operation are briefly as follows:—The patient is first put under the influence of chloroform, followed or not by ether, and the jaws kept wide apart by means of a gag. The levatores palati and the palato-pharyngeal muscles are then divided by means of a rectangular knife. After this the mucous membrane is pared from the edges of the cleft, care being taken to remove mucous membrane only. Two apertures are then made, with an awl, through the hard palate on each side of the fissure and close to the edge, the holes on one side exactly corresponding with those on the opposite side. A fine silk suture is then passed from the mouth through each of the holes on one side, across the floor of the nasal cavity, and made to enter the mouth again through the corresponding holes of the opposite side. An incision from before backwards is then made through the mucous membrane and periosteum on each side, just outside the sutures. The operator, by means of a small chisel, next cuts through the hard palate in the site of these incisions. The two pieces of bone thus detached are then forced towards the middle line, and fixed by means of the sutures. Where the hard and soft palates are operated on at the same time, Sir William usually puts two sutures into the hard palate, and three in the soft,

and fixes them in the following order:—Reckoning from before backwards, the second suture in the hard palate is first tied, then the three sutures in the soft palate, and last of all the foremost suture in the hard palate. When everything is thus made firm, lint is placed into the apertures in the hard palate made with the chisel, and allowed to remain two, three, or even four days. The lint is then removed, the sutures taken out, and the parts left to recover. It is interesting to note that the hard palate soon becomes consolidated, so that in a few months it often seems to be bony throughout; or, if not bony, to be at least made up of very dense fibrous tissue.

Recently we saw the operation as described above performed on a man aged about thirty, whose case had previously been considered almost too bad for any surgical interference, the patient having for many years worn an obturator. On the same day we had the opportunity of observing the excellent results obtained in three or four other cases that had been operated on within the last four or five weeks, and are still in the hospital.

## Editorial.

#### THE LYMPHATICS OF THE LUNG.

A SECOND very valuable and important series of researches on the Lymphatics, undertaken for the Medical Department of the Privy Council, has just been published by Dr. Klein, the assistant-professor at the laboratory of the Brown Institution. The present volume deals with the Lymphatics of the Lung, both in their normal and in their pathological conditions; and Dr. Klein informs us in the preface that the research was originally intended to ascertain the relation of the lymphatic system of the lung to the process of tuberculosis. It was soon ascertained, however, that the incomplete state of our knowledge of the lymphatics of the lung rendered it imperative to subject them to a careful scrutiny with a view of discovering their minute distribution. The result of the investigation has proved of extreme value in elucidating the process of artificial tuberculosis in guinea-pigs, and the process of acute miliary tuberculosis in man, which are fully discussed in the second section of the volume.

Dr. Klein commences his account of the normal condition of the pulmonary lymphatics by a minute description of the cells investing both the costal and the pulmonary pleura; in the course of which he shows that, whilst those of the costal pleura are ordinary pavement epithelium, those of the pulmonary pleura present considerable differences, according to whether they are examined when the lung is in a contracted or in an expanded state. In the expanded condition of the lungs the cells

forming the endothelium covering it are flattened, rather thicker at their centres than at the periphery, with pale and transparent cell-substance, and discoid excentric nucleus. When stained with nitrate of silver the lines of junction of the cells are marked by fine, dark striæ, enclosing polyhedral areas. In the contracted condition, on the other hand, the cells are no longer flattened plates, but are polyhedral or even columnar, with rounded apices; their contents are distinctly granular, and the nucleus has assumed the form of a slightly flattened spheroid. The change in the form of the cells causes a different appearance to be presented when the superficial and the deeper parts are respectively brought into focus. In the former case the cells appear as spherical bodies, separated from each other by broad furrows; in the latter case they appear like a continuous mosaic of cells, separated by thin intercellular lines. Dr. Klein points out that the differences between the endothelial cells of the collapsed lung and those of the costal pleura are very similar to the differences observed by Waldeyer between the cells covering the upper part of the ovary and those lining the peritoneum generally.

He next considers the matrix of the pulmonary pleura, which he describes as composed of very delicate bundles of connective-tissue fibres, with a few fine elastic fibres crossing each other in various directions, and leaving spaces between them, each of which contains a flattened nucleated connective-tissue corpuscle. These spaces, with the contained corpuscles, intercommunicate freely, and constitute the so-called lymph canalicular system. In guinea-pigs there are in addition slender bundles of unstriated muscle-fibres, arranged so as to form a network with long rhombic meshes. The position, and arrangement of these fibres are minutely described, and it is shown that the lymphatics are in close relation with them; and that since the meshes enlarge and contract with the movements of the lung in inspiration and expiration, they must exert a pumping action, exercising an important influence in promoting absorption from the pleural cavity. But the question naturally arises, Is there any direct communication between the cavity of the pleura and the lymph canalicular system? And Dr. Klein answers this in his third chapter by showing that there are stomata surrounded by germinating epithelium on the surface of the pulmonary pleura, which are connected by short vertical tubes communicating with the lymphatic lacunæ of the muscular coat, which again communicate with the subpleural lymphatics, the distribution of which he carefully describes. In the mucous membrane of the bronchi the lymphatics open on the surface in a different way. Here there are indeed no stomata nor vertical tubes, but Dr. Klein has discovered what he terms a pseudo-stomatous tissue, consisting of isolated connective-tissue cells,

differing in their shape, their refractive power, the character of their nucleus, and their mode of staining—in short, in all their morphological characters—from the adjoining epithelial cells. These cells occupy spaces which, like the true stomata, form communications between the free surface and the submucous lymphatics, but, being filled with the cells, are impervious, unless the tissue is expanded or distended. Further investigation showed that there is a system of perivascular lymphatics around the bloodvessels of the alveoli.

It thus appears that the radicles of the lymphatics of the lung are distributed over three different parts—the walls of the alveoli, the walls of the bronchi, and the pulmonary pleura. The first system is represented by irregular lacunæ and anastomosing vessels, being the spaces for the branched connective-tissue corpuscles. Some of the vessels of this system, appearing on the surface, form the *subpleural lymphatics*; whilst others accompany the branches of the pulmonary artery and vein, and constitute the *perivascular lymphatics*; the larger vessels running towards the root of the lung. The second system is represented by irregular lacunæ and anastomosing canals in the mucosa, both of which are lined by connective-tissue corpuscles; the lymphatic vessels originating in these have a special endothelial wall, and form a network of *peribronchial lymphatics*, in connexion with which are some lymphatic follicles, and discharge themselves into the same efferent vessels as the perivascular lymphatics of the alveoli. The third system is that of the pulmonary pleura, which, as already stated, is supplemented in the guinea-pig by a system of *inter-muscular lymph spaces*. The subpleural lymphatic vessels stand in a direct open communication with the pleural cavity by means of *stomata*; whilst the radicles of the perivascular and peribronchial lymphatics stand in an indirect communication with the alveolar cavities or the surface of the bronchial mucous membrane, respectively, by means of *pseudo-stomata*.

We shall proceed on another occasion to show the bearings of these anatomical facts upon the pathology of the lung, a subject of the utmost interest in relation to the most important disease of this country—tuberculosis.

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## THE RAPIDITY OF THE SENSORY CURRENT IN MAN.

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A NEW series of researches has just been published by M. Bloch on the Rapidity of the Sensory or Centripetal Current in Man. The experiments, which were performed in the laboratory of M. Bernard, appear to have been made with considerable care, and the memoir was read before the So-

ciété de Biologie. The experiments of Schelske, undertaken previously, gave as a mean a rapidity amounting to 29·60 metres per second for sensory impulses. In repeating these experiments merely for the purpose of confirming their accuracy, M. Bloch considered it requisite to determine the duration of the persistence of tactile sensations; and for this purpose employed a small disc with projections. This was rotated with increasing speed till the sensation of successive shocks was lost. It was found that when the shocks exceeded fifty per second the sensation became uniform. This fact appeared to him in contradiction with the results obtained by Schelske, at least so far as analogy went; for it is known that, in regard to the senses of vision and audition, the persistence of the impression is longer than the time occupied in its transmission to the cerebrum. But there was here a contradiction to this rule; for with a period of transmission amounting, according to Schelske, to about one-thirtieth of a second, the persistence of the impression was only one-fiftieth of a second. It is unnecessary here to give the details of M. Bloch's mode of experimentation; but it consists essentially of a wheel with a thin piece of quill projecting from its border. This is made to revolve, and, as soon as the sensation is felt, the finger is flexed and scratches a line on the surface of a smoked glass within the rim of the wheel. The physiological time embraces several elements—namely (1), sensation, including its reception at the integument and its transmission through the sensory nerves; (2) the transformation of the sensation into voluntary effort; (3) the transmission through the motor nerve; and (4) the execution of a muscular contraction.

M. Bloch soon found that no modification of experiments of this nature gave satisfactory results, because in all instances the elements of the calculation include a factor—namely, the period occupied in the transformation of a sensation into a voluntary effort—which is incapable of precise estimation, and varies with different individuals and under different circumstances, so that an excitation received by the hand or fingers can actually be recorded more quickly than one received on the forearm or face, though the course of the sensory nerve is manifestly shorter. He then modified his method, founding it on the longer or shorter persistence of the sensations; so that, if two shocks are received successively, one by each hand, when the interval between these two shocks is sufficiently short (one forty-fifth of a second on the average), the two sensations are felt as one. The only explanation of this is that the sensation of the first shock persists with an intensity not sensibly altered when the sensation of the second shock arrives. This persistence appears to augment in duration in proportion as the shock is more rapid, though in feeble proportion. If the second shock be re-

ceived by some part nearer the sensorium than the first—as on the nose,—apparent synchronism can only be obtained by allowing a longer interval to elapse between the two. The difference of the two intervals will, it is obvious, measure the difference in the duration of the transmissions from the more distant and the more approximate point to the sensorium. The impressions made must of course have the same intensity. The general result of all the experiments performed on these principles gave a much larger figure than that obtained by M. Schelske—namely, 156 metres per second. The rapidity of transmission was greater in the spinal cord than in the nerves, being 194 metres per second in the former and 132 metres per second in the latter. One other fact was ascertained in the course of the experiments—viz., that the persistence of a tactile sensation augments as the acuteness of sensibility diminishes.

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## Medical Annotations.

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"Ne quid nimis."

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### COLOR AND HEAT.

THE curious, though somewhat costly experiment of the willow-pattern plate should not be allowed to slip out of memory. It has a bearing on the question of public health. Dr. Richardson did not allude to the topic in his graphic outline of "Hygeiopolis," but it could not be wisely excluded from a scheme worked out more fully than was possible with a fancy sketch, however suggestive and interesting. Having provided your plate, and sacrificed it to the cause of science, you put it into the centre of a clear and brisk fire. Of course it flies to pieces, but some of the fragments are probably large enough to be taken out with a pair of tongs when heated to redness, and exposed in a dark room. The pattern glows white on a dark ground, the explanation being—to speak roughly—that the dark color of the pattern first absorbs, and then gives off, more heat than the white ground. Apply the same principle to the surface of a town or city exposed to the sun. The relative proportions of dark-colored area, whether foliage, grass, earth, or black-slate roofing, and of light-colored surfaces, such as stone pavements, macadamised or chalky roads, will determine the heat absorbed from the sun's rays by day, and the radiant heat given off by night. But more than this, there can be no doubt that just as the comparative heat of tropical and cold regions is one cause of winds—the cold air rushing in horizontal currents from the cooler to the warmer districts of the earth's surface,—so, in a smaller, but not unimportant degree, the displacement of the lowermost strata of the atmosphere, and the consequent ventilation of streets and houses, is affected by the color of large tracts of surface in and around our great cities. The preservation of green lands has a sensible effect on the healthiness of adjacent residential

property wholly apart from the facilities which these grounds may offer for pleasure and exercise. The larger bearings of these considerations will be obvious, and one small but singular custom, in which we fly in the face of nature, should be modified by them. White hats and clothes are worn in the summer because they do not so readily as dark-colored articles absorb the heat. This is a rational expedient, but it is not so reasonable to forget, when winter comes round, that dark surfaces radiate heat, or allow it to escape, as rapidly as they absorb it. At a season when the heat of the body is almost entirely generated and supported from *within*, it seems unaccountable that people should so commonly affect dark clothing. The fact that animals in the cold regions are provided with white furs in winter points to the more judicious selection. The rule is simple enough. When it is wished to take in heat easily or to give it off rapidly, the surface should be of a dark hue; when the object is either to keep out the external heat or to preserve that which is generated within, the color should be white or bright. The practice of putting on the most sombre and depressing garb at a season when everything has a tendency to look gloomy is unnecessary, and considering that it is the reverse of cheery, it might, with advantage to health and spirits, be extensively modified. There should be no difficulty in procuring stuffs for clothing combining sufficient substance and low-conducting material with light and cheerful colors.

#### EXPERIMENTAL RESEARCH ON THE TOXIC PRINCIPLE OF PUTREFYING BLOOD.

V. FELTZ employed in his investigations on this point blood which had been exposed to the air for several months. Microscopic examination, undertaken from time to time, demonstrated that the mobility of the spirilla and vibrios progressively diminished, and they ultimately disappeared entirely. The bacteria and the zoogloea membranes resisted putrefaction for a longer period, but likewise lost their mobility, and finally nothing could be seen in the fluid but a confused and motionless mass of rods and granules. Coincidentally the smell of the blood became less pungent, and the production of ammoniacal compounds diminished. An injection being made of such putrescent blood (in quantity amounting to two cubic centimetres) into the veins of a dog, the phenomena of infection appeared, as evinced by elevation of temperature, loss of appetite, vomiting, bilious and even bloody evacuations. Four of the animals died in the course of ten or twelve days, but two others recovered completely. Old putrefied blood, in which no trace of life could be discovered, exhibited the same toxic action as that in which germs and fungus seemed to be in full activity, and it would appear that the septic action must be referred to some chemical agent which results from the presence and perhaps from the decomposition of the organisms, but is not due to the organisms themselves. On the other hand, the blood of the animals thus poisoned by decomposing blood exhibits numerous bacteria and coccobacteria, notwithstanding the fact that no living germ is present in the blood injected. Putrid blood which had stood for five months in the sun, and which had acquired a doughy consistence from evaporation, was perfectly dried in the air-bath

and rubbed down to a fine powder. The impalpable powder was mixed in small quantity (one-half c.c.) with two to three c.c. of water, and this was injected into the crural veins of three powerful dogs. The animals immediately exhibited marked depression. After four or five days febrile symptoms were established, with bilious and bloody diarrhoea, vomiting, and biliary urine. Two of the three dogs died after ten days. The blood contained bacteria, and the red blood corpuscles showed the well-known changes in form and disposition to break up exhibited by those of animals infected with septic blood. Nevertheless, the most minute investigation failed to reveal the existence either of living bacteria or vibrios in the dried powder either before or after its mixture with water. Now, since blood at all stages of putrefaction, till it has even undergone complete desiccation, after a certain period of incubation, induces septic phenomena, we must admit, according to Feltz, that motionless and apparently dead germs are present in the injected fluid, which, when thrown into the healthy blood, return to life, and are capable of reproducing the septic condition.

#### PROPYLAMIN IN ACUTE RHEUMATISM.

THIS remedy, which was first recommended by a German army surgeon, has been used with remarkable success in the Garrison Hospital at Dresden. According to his report in the *Berlin Klin. Wochenschrift*, Staff-surgeon Dr. Leo treated twenty-eight soldiers exclusively in the manner first tried by Dr. Loewer, of Altenburg. Of a solution of one gramme of the drug in 120 of peppermint-water, with 10 of sugar, a tablespoonful was given every two hours; altogether from three to five grammes were so taken by each patient, whose limbs were bandaged with cotton-wool and cardbord. All the twenty-eight cases suffered from multiple joint affections; in fourteen cases the disease appeared for the first time, in the other fourteen it was recurrent once or repeatedly. Five cases were complicated with slight, five with severe affection of the heart, one with acute oedema of lungs, and one with diphtheria. All were restored to perfect health and military duty except one, which required a course of the Teplitz waters, though there is a certain prospect of his ultimate fitness for service also. The average duration of the illness in these cases was 17.7 days per head; none was discharged before full recovery was proved by increased weight of body and gymnastic exercises. The effect of propylamin is summed up by the author to have been marked by the following points:—1. The disease becomes very soon subacute, and remains so to the last. 2. The sedative effect on the nervous system is shown by decreased tension in the circulatory apparatus; pulse and respiration become slower, and high fever decreases within thirty-six hours. 3. With at first profuse, then more gentle perspiration, pain decreases very markedly. 4. The color of the skin acquires a peculiar greyish tint (?). 5. Sleep quickly returns, and is not interrupted by pain. 6. With a cleaner tongue appetite returns fast. 7. The quantity of urine is not much increased; it is mostly clear and transparent, only slightly acid, and with little sediment. 8. All patients took the drug without dislike; it was never applied externally. The discrepancy of results in the use of



propylamin Dr. Leo ascribes to the great differences in its preparations. According to the careful analysis of Petit, the amount of alkali in the official drug varies from 0.02 to 0.55 in 1 gramme. This may be due to the defective mode of preparing it, or to the variable constitution of the herring-brine from which it is made.

#### AIR-PRESSURE IN THE TREATMENT OF DISPLACEMENTS OF THE UTERUS.

DR. CAMPBELL, of Georgia, advocates the use of air-pressure in the reposition and treatment of displacements of the uterus. He places the patient not in the "knee elbow," but in the "knee-and-breast" posture. In this position the breast rests on the couch, the knees are placed perpendicular to the same, and the spine allowed to become convex downwards. This permits complete relaxation of the abdominal muscles. While the patient occupies this position he admits air into the vagina, and by this means replaces the uterus. He further recommends "nightly self-replacement," and for this purpose advises the use of the "pneumatic self-repositor." This is a slightly curved tube of glass open at both ends; one end of the instrument is to be introduced into the vagina by the patient in the "genu-pectoral" position, and, according to Dr. Campbell, "self-replacement is completely and instantly accomplished." We have often tried this method, and have found that in some cases it answers admirably, while in others it fails as completely in effecting reposition of the organ. The cases in which it fails are not only those in which adhesions exist, but almost all cases of acute retroflexion with enlargement of the body of the uterus—cases in which reposition can be effected generally by the hands. The cases to which the method recommended by Dr. Campbell applies are, so far as our experience goes, those only where the displacement is slight, and which can easily be reduced by the hand.

#### DESICCATED BLOOD.

SOME observations on desiccated blood were recently communicated to the Academy of Sciences of Paris by M. Le Bon. If blood is reduced, by simple evaporation, to a solid, the resulting powder is absolutely insoluble and indigestible; it may be macerated for twenty-four hours with a solution of pepsine and acid without being altered. But by evaporation at a low pressure and at a temperature which does not exceed that of the body, M. Le Bon has succeeded in obtaining a powder which, even after being kept for eighteen months, is readily soluble in water, and yields a red solution which has exactly the properties of defibrinated blood, is precipitated in the same manner by heat, and shows under the spectroscope the absorption bands of hæmoglobin. The powder is as soluble in an acidified solution of pepsine or in simple water, a fact which sufficiently proves its digestibility. The therapeutical application of this preparation are important enough if its characters are uniform.

#### BULLETS AND BRAINS.

THE manager of a New Jersey paper has for the last seven months been known as "The Editor with a Bullet in his Brain." He was shot in his own office in March last, and recovered so completely that his assailant was released on bail, but relapsed, and died on the 24th of last month. A post-mortem examination was made, and "the bullet was found encrusted within the tentorium, beneath the posterior lobe of the right hemisphere." Three abscesses were found on the right hemisphere, there was marked congestion of the pia mater on the floor of the right ventricle, especially on the right side; the cerebellum was wholly uninjured. The opening (made by the bullet) was an inch to the right of the occipital protuberance, and half an inch above the groove of the right lateral sinus. We may expect further particulars of this interesting case.

#### MUSCULAR CONTRACTILITY IN A DECAPITATED CRIMINAL.

M. ONIMUS has had the opportunity of examining the muscles of a decapitated criminal shortly after death. He found that two hours after execution the right auricle beat spontaneously. The ventricle was quiescent, but the slightest stimulus applied to it caused it to contract. After the lapse of five hours, constant currents applied to the skin caused contraction of the subjacent muscles, though the same stimulus applied directly to the nerves no longer induced contraction.

## New Inventions

IN AID OF THE

### PRACTICE OF MEDICINE AND SURGERY.

#### A FLEXIBLE CLINICAL STETHOSCOPE.

EVERY practitioner has occasion to feel often the need of a longer instrument than the ordinary stethoscope, and one which by its flexibility permits him to vary his position with relation to the patient. Arnold and Sons have produced a flexible stethoscope which meets this want. (See figure.)

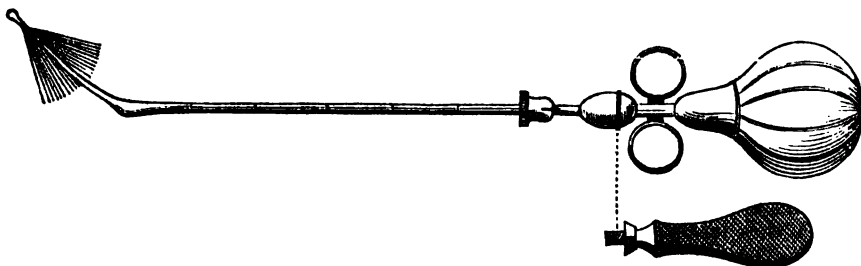


Its novelty consists not so much in its length and flexibility as in its ear-piece, which is made of well-polished vulcanite, and is so shaped as to fit the meatus of the ear. Moreover, the ear-piece has a small perforation on one of its sides, which is intended to prevent the air from impinging unpleasantly upon the membrane of the tympanum when the chest-piece is moved or first applied. On commencing to listen the perforation is to be

closed with the finger. We are not clear that the instrument conducts sound better than the ordinary stethoscope, but its utility in certain circumstances of frequent occurrence is obvious.

### NEW COMBINED SOUND AND SYRINGE FOR UTERINE PURPOSES.

A COMBINATION of uterine sound and syringe is a desideratum which has been found in use most convenient. The instrument of which we give an



engraving can be used as an ordinary uterine sound; but when, as in many cases, it is desirable to introduce fluids into the cavity of the uterus, the combination will be found extremely convenient, inasmuch as the douche can be effected without the necessity of removing the sound. The sound is hollow, and has a bulbous extremity to facilitate introduction; it is perforated diagonally, so that the fluid flows in the reverse direction and douches the entire extent of the uterine cavity. The instrument is very neatly constructed by Messrs. Salt and Son.

## News Items, Medical Facts, &c.

**ACTION OF METALLIC ZINC ON NITRATE OF SILVER.**—Prof. Corradi has proposed, after an ulcer or wound has been cauterised with nitrate of silver, to touch the spot with metallic zinc. The caustic action is thereby increased, and from a minute study of the phenomena it is concluded that nitrate of zinc is produced. M. Jullien, deputy professor at the Faculty at Nancy, introduced this method at Lyons, after a journey to Italy; and M. Jules Chéron, Surgeon to the St. Lazare Infirmary of Paris, has just published a paper on the subject. This paper has been the subject of an article in the *Lyon Medical* (Oct. 17th, 1875) by M. Aubert. M. Chéron has applied this method especially in fungating syphilitic ulcerations. 18 patients treated by the nitrate of silver aided by the zinc were well in 9 days on an average; whilst 23, on whom the acid nitrate of mercury was used, took on an average 29 days to recover; and 26 patients treated simply by rest, inert applications, and baths, averaged 59 days before they were well. Of course such data are rather vague, as it is not said whether all the patients had the same internal remedies. It may be observed that the stick of zinc immediately applied to the locality touched with the nitrate of silver produces a black coloration, which is owing to a chemical change, the nature of which is a subject of controversy. M. Aubert, as we stated above, considers that a nitrate of zinc is formed; and hence he proposes, considering the success obtained, to substitute the latter salt for the nitrate of silver, which is expensive and apt to stain the linen and fingers.

**THE STUDY OF ORGANS EXTRACTED FROM THE BODY.**—At the late Congress of Brussels, Dr. Heger read a paper on Artificial Circulation. This consists in killing an animal, and removing from it a viscus, as, for instance, the liver, the lung, or kidney. The circulation is kept up in the organ by means of defibrinated blood taken from the same animal or one of the same species. A viscus extirpated from an animal retains its vitality for some time; and when this viscus is kept, as it were, alive by artificial circulation, its functions and its peculiar properties may be studied. Experiments have gone further in these researches, and even the action of medicines, as atropine and chloral, has been watched upon isolated and extirpated organs kept alive by artificial circulation.

**INGUINAL HERNIA: NOVEL MODE OF REDUCTION.**—The *Lyon Medical* of October 17th, 1875, quotes an article of the *New York Medical Record* (July 24th, 1875) of Dr. Hadden. To reduce an inguinal hernia in a woman of forty-five, who refused kelotomy, the author narcotised the patient with chloroform, introduced his finger into the rectum, and gradually passed his hand as far as the colon. The hand was somewhat obstructed when it reached the promontory of the sacrum; but this obstacle being overcome, it travelled higher up. Dr. Hadden states that he then succeeded in feeling the congested intestine, and used gentle traction with the hand within the abdomen, whilst with the other he performed gentle taxis externally. The reduction was thus effected, and, though the patient complained of severe pain in the anal orifice and the colon, she made a good recovery.

**THE PERSISTENCE OF SYPHILIS.**—Some physicians exaggerate this persistence, although it is well known that persons who had formerly suffered from lues venerea have reached a ripe old age without having experienced a relapse. Among these pessimist physicians must be placed Dr. Zeissel, of Vienna. *L'Union Médicale* quotes a passage from one of his lectures delivered a short time ago:—"Some people think that when a patient has for a while shown no signs of syphilis he is quite cured; but I can tell you, gentlemen, that when a human being contracts syphilis he will die syphilitic, and at the day of judgment he will".....We refrain from translating the professor's concluding words.

It is asserted by M. Vidal that the addition of chloral to a solution of morphia renders it much less liable to spontaneous change. This fact, if it be true, is important. The alteration which concentrated solutions of morphia undergo renders their strength variable and uncertain if they are laid by for a time. M. Vidal adds to the solution a quantity of chloral equivalent to twice the weight of the morphia it contains. He affirms that the injection of this mixture is not painful.

**CARIOUS TEETH.**—Dr. Lardier advises, in *L'Union Médicale*, to drop some collodion into carious teeth, after the latter have been cleaned and dried. The liquid collodion exactly fills the cavity of the tooth; the ether evaporates, and narcotises the nervous twigs. By solidifying, the collodion protects the tooth from the contact of the air. Dr. Lardier states that he has thus succeeded in relieving many patients.

PRINTED AND PUBLISHED BY

WM. C. HERALD, No 52 JOHN ST., NEW YORK.

# THE LANCET.

A Journal of British and Foreign Medicine, Physiology, Surgery,  
Chemistry, Criticism, Literature, and News.

JAMES G. WAKLEY, M.D., M.R.C.S., EDITOR.

PUBLISHED MONTHLY.

No. 2.

NEW YORK, FEBRUARY, 1876.

PART OF A

## Lecture

INTRODUCTORY TO THE COURSE GIVEN AT

UNIVERSITY COLLEGE HOSPITAL,

*Delivered on November 15th, 1875.*

By Sir HENRY THOMPSON,

Surgeon Extraordinary to H.M. the King of the Belgians;  
Emeritus Professor of Clinical Surgery in University College  
Hospital.

(Reported by Mr. G. BUCKSTON BROWNE.)

AFTER a few words of introduction, expressive of the pleasure which it gave the lecturer to return to the scene of his former labors for a short time, he defined the nature of the course and its scope, alluding to various minor points in connexion with it. He then said:—

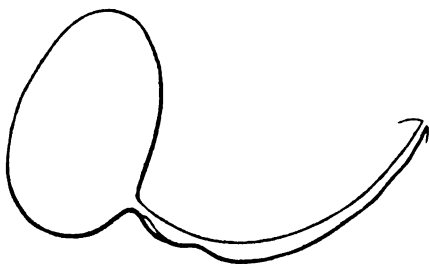
In view of a consideration of the more important affections of the urethra, with which I shall naturally commence, I desire to depart from my usual habit a little to-day, and to speak more at length on a topic which I always allude to slightly, but not otherwise, because it is not part of my plan to teach anatomy and physiology here. But I find it necessary to complain of what I will speak of as the "too mechanical method" of treating urethral diseases, which I think has been obtaining of late in some parts of the Continent, and perhaps in America. What I mean by that will appear as we proceed. I always protest against it in this course of lectures, but something more than this appears to me now to be desirable. I dislike to be polemical in this or any other subject, the practical side of which is so important; and I would infinitely rather for my own peace and comfort simply tell you what I think you ought to do in relation to various circumstances which come before you, and not also have to point out treatment pursued by others which I think you ought to avoid. However, I have the conviction that much of the treatment now in vogue is imperfect and less valuable than it might be, since it is

founded on views of the urethra itself which are erroneous; or rather, I should say, it originates in a want of consideration, which appears very widely to exist, as to the nature and function of the urethra.

The treatment of urethral disease of which I complain has its origin in the notion that the urethra is a mere flexible tube, closed at or near its junction with the bladder by some kind of muscular apparatus, sphincteric or otherwise, through which fluids will pass indifferently in either direction. No idea, however, can be more erroneous, and treatment founded on it must be defective.

At the outset, then, let me say that it is absolutely essential that you should have a tolerably accurate knowledge of the nature and functions of this so-called tube.

I draw for you on this board the kind of diagram usually supposed to represent the bladder and male urethra. This diagram has something to answer for in producing the erroneous views I refer to. It represents the urethra as a tube, and as more or less open.



Let me give you an illustration of my meaning, and not an unimportant one. I believe I am correct in stating that almost every patient who presents himself for treatment of a urethral discharge, when advised to use an injection, gets some such advice as this, when the manner of doing it is explained, as it ought to be, in detail:—He is told to inject a certain quantity of liquid into the passage by means of a syringe of some kind, and in doing so he is always admonished to make pressure on the line of the urethra, some four inches from the orifice, in order to prevent the fluid from passing beyond that point, and so perhaps enter or irritate

the ducts which open into the prostatic portion, and occasion irritation of the neck of the bladder or a swelled testicle—an idea which is far from correct; and such advice simply demonstrates that the person giving it is not really acquainted with the structure or function of the part he is treating. Want of thought originally has produced, and the influence of ancient tradition perpetuated, the error which vitiates much of our treatment in its various forms.

First, let me assure you that the urethra is not a tube at all, in any sense in which we employ that word. It is not like a gas-pipe, or an india-rubber tube, or even a flaccid tube of any membrane whatever.

It is rather *a continuous closed valve, capable of transmitting fluids and solids in one direction only, and transmitting nothing whatever in the opposite direction, except in obedience to applied force.* Its length in the male makes us think of it as a tube, but this is a mere accident of sex. An inch or less is amply long enough for its urinary function, as in the female; and all the length it possesses above that is quite useless *as a urethra*, and renders it liable to disease and accident—the price, and a heavy one, let me tell you, which the male pays for his specially distinguishing feature. In illustration of this, I have but to refer you to the innumerable difficulties and dangers associated with stricture, retention of urine, and calculus, which are almost unknown in the other sex. It is, then, in the male simply a long valvular chink, traversing soft and most delicate vascular and nervous tissues, always firmly closed, and never opening except for a few seconds, during which fluids have to be transmitted from the body. Then, for a few seconds, it is distended more or less, and becomes a tube if you please, for this short time and this only, equalling, perhaps, at most three minutes in the twenty-four hours. All the rest of the time it is firmly closed, and not one drop of fluid can pass from the bladder. Of course, oozing of liquid which is generated in the walls of the tube, or which enters it by ducts may escape, but always, inevitably, in the outward direction only.

Now, during these few seconds, when the valve may be said to occupy the form of a tube, I have next to observe that it is a tube of very varying diameter in its different parts; it is, in fact, very differently distensible at different places, being surrounded by different structures. This fact has long been known and generally recognised. I will show you illustrations of this from the works of Sir Everard Home and of Mr. Guthrie, who made casts of it in wax and other materials. This point is scarcely of less importance than the preceding one. The annexed diagram is reproduced from Sir E. Home's work.\*



Having thus far illustrated briefly, and neces-

sarily somewhat imperfectly, the nature of this valvular passage, let us see how far the ideas which I want you to acquire relative to the urethra affect two important points in practice. First, that simple matter of making an injection into the urethra. You have to introduce a fluid for the purpose of therapeutic contact with the walls of this closed passage; you have to distend it, and some little force is necessary; not a single drop can enter, much less run down into it, unless the liquid is forced in by a piston, while the orifice of the urethra is carefully closed around the tube of the syringe introduced. The walls of the passage lying closely applied to each other become opened only by the pressure of the fluid driven in, and they are distended just so much and so far as the quantity employed determines. Thus you may safely reckon, as the result of my observation, that a syringe containing one fluid drachm is amply sufficient, and that it will distend the urethra for three and a half or four inches. A half-drachm syringe often suffices. Here is one of each size, and it is scarcely necessary to say that these small instruments are much more easily managed by a patient than larger and longer ones. But most patients, unless specially taught to use the syringe, never introduce any injection at all. Unless the orifice of the urethra is carefully closed at the time, the fluid simply leaves the end of the syringe and flows out by the external meatus; and in every case after the injection has been made, the moment the orifice is unclosed the fluid is rapidly expelled by the contractile force of the urethra, and no appreciable quantity remains within. So much, then, for any fear of its running down to the neck of the bladder. Of course, if an injection is too strong—in my opinion a very frequent occurrence,—the anterior part of the urethra is inflamed, and extension backwards may easily take place; but that is no part of our subject now. But let me further say that, so far from your being able, even with the power of the syringe, to send an injection into the prostatic part of the urethra, you cannot do so by any ordinary force, unless you can at the same time voluntarily relax the muscles which surround the membranous urethra, and so allow the fluid to pass—a thing perfectly possible with very little practice to accomplish. Thus it is that you cannot inject the bladder except by passing an instrument into its cavity. In fact, this valvular passage stoutly resists all intrusion from without, and admits no fluid except in obedience to pressure which it is unable to resist.

I must just remark, in order to anticipate a possible objection to my statement relative to the valvular action of the urethra, and its power to transmit bodies in the outward direction only, that it is well known that certain foreign bodies have been able to pass inwards when introduced by the external meatus. I refer to two typical ones, both of which have been occasionally known to reach the bladder after being fairly lodged within the urethra. I refer to an ear of barley or of rye, both of which you will recollect are bearded, and also to a common hair-pin, which is wedge-shaped. Either of these bodies, if completely introduced, and also in such a manner that the beards or the points are directed outwards, will traverse the urethra in the direction inward. These, however, you will doubtless at once see are not in the least degree exceptions to my statement. It is an old schoolboy's paradox to put an ear of rye in his

\* Practical Observations. By Sir E. Home. Vol. I. London, 1805.

jacket-sleeve, when, with slight movements of his arm, although directed downwards, the ear soon finds its way upwards to his shoulder. If the arm was kept perfectly motionless there would be no change of place in the ear of rye. So, when introduced within the urethra, the involuntary movements of the urethral muscles, designed to expel the intruder, act on the ends of the bearded corn, or on the ends of the hair-pin, and drive it on in the only direction it can travel—namely, inwards. I am not sure that it was necessary to mention this, but I have known the peculiar action of these bodies referred to as militating against the uniformity of the action of the urethra referred to, while in fact they do but illustrate its existence. If the urethra submitted tranquilly to the intrusion, and made no expulsive effort at all, the foreign bodies would not travel; as it is they must move, and can only do so in one direction. Of course it is due to this function of the urethra that gravel and small calculi are expelled in great number, and that the morbid excretions in gonorrhoea, &c., always issue externally, and never go backwards to the bladder.

The second point of importance in which the structural function of the urethra which I have described should affect our practice is associated with treatment of stricture of the urethra. I do but allude to this now, and shall reserve what I have to say on this head until a future lecture, when I shall enter fully on the subject.

## A Clinical Lecture

ON

## DIAGNOSIS,

*Delivered at University College Hospital on  
November 18th, 1875.*

By Sir HENRY THOMPSON,

Surgeon Extraordinary to H.M. the King of the Belgians;  
Emeritus Professor of Clinical Surgery in University College  
Hospital.

(Reported by Mr. G. BUCKSTON BROWNE.)

GENTLEMEN,—You will recollect I announced at our last meeting that the subject for our inquiry to-day would be the Diagnosis of Diseases of the Urinary Organs. Now let me remind you at first starting that the diagnosis of disease is the one important thing that you come to the hospital to learn.

I know that the youth, when entering on his professional career, and also that heterogeneous body which is designated "the public," and to whom he at present belongs, regard, and quite naturally, the treatment of disease as the great subject which is to occupy all his time and powers. True it is his final object, but it is essential for him to know that the art of diagnosis is far more difficult and important to attain, that it demands labor, study, and experience, and that without it treatment is useless, or even worse, for it may be injurious. But let him be assured that if the diag-

nosis be intelligently made, then treatment is comparatively easy.

It must be admitted, however, that there is some difference between medicine and surgery in relation to this statement. The medical art may almost be said to culminate in diagnosis. I can remember the time when to distinguish between mitral disease and functional disturbance was more a matter of guess-work than of demonstration. At that period the early presence of phthisis was undistinguishable, and the arrival of its later stages a subject for widely differing opinions even among experienced men. These conditions verified, however, as is quite possible to the advanced among you, thanks to modern methods of physical examination, there can be small difficulty about the treatment, and little difference of opinion.

In surgery the diagnosis is no less important, but the treatment is less easy. The operative measures which often follow demand practical skill and certain other qualifications. Even here, however, diagnosis must take the first place, because operative treatment, being often of a very grave character, cannot be undertaken until after a correct and intelligent appreciation of the facts has been obtained.

What is diagnosis? It consists, first of all, in the acquisition of facts; and, secondly, in obtaining legitimate inferences from those facts.

Now the acquisition of facts is one of the most difficult things in the world. No two persons ever agree in their statements descriptive of an occurrence to which they both have been witnesses. If I bring a case of disease before you here, and ask ten of you to take as many histories of it, I will undertake to say that each one will materially differ, and that I shall get ten histories, varying from each other in some important particulars. Each will be approximately true; none will be absolutely correct. You must then diligently learn to observe, and to do so well requires special qualities and much practice. Is it not a very striking illustration of what I have said, that if two witnesses relate precisely similar stories of any given event, the suspicion of collusion is always instantly suggested, and is, indeed, very naturally aroused? It has often struck me that the qualities which men of our profession require, and which we should endeavor to cultivate, are precisely such as are necessary to those who are engaged in the exercise of the legal profession; and the men who are really successful in either profession have much in common in intellectual character and attainment. In our profession, equally with that of the law, careful examination of the statement, acute and subtle cross-examination of the witness, and a keen pursuit of the simple fact are essential; and, finally, a calm judicial habit of weighing the facts when obtained. And in both professions the issues raised are equally weighty, and demand in either case the highest qualifications in the individual.

But next, I have not only to call your attention to the necessity for making a careful and accurate diagnosis, it is equally important that you should learn to make a *rapid* one. For it must be admitted that our proceedings differ from those of the law in this respect; for while, as we have seen not so long ago, several months may be devoted to the critical investigation of a legal claim, and a considerable period of time must mostly be expended on the proof or disproof of any allegation,

our decisions are required without delay. While the doctors are deliberating the patient is dying. Hence you see that the ability to arrive at a diagnosis rapidly often constitutes the essence of success. This art, also, it is my aim to teach you so far as I can.

To this end, and what I have to say applies to all departments of our art, I advise you always to pursue a uniform method. Order and uniformity are essential elements in directing the necessary investigation; and after much thought and experiment, for my own private guidance as well as for yours, I have adopted the following system. Relative to the class of diseases we are studying, there are three methods of obtaining the facts required:—Firstly, by questions of the patient; secondly, by physical examination of the body; thirdly, by examination, chemical and otherwise, of the secretions.

First, by questions. There are four chief questions which I always employ, and always in the same order. They ought, with the minor inquiries which branch out of them, to determine six out of seven cases which come to you. They relate to four signs and symptoms more or less met with in patients affected with complaint in any part of the urinary organs. Frequent micturition; painful micturition; deviation in the character of the urine itself from the healthy standard; the addition of blood to the urine.

The first question, then, which I invariably ask to any patient so affected is, "Have you any, and, if any, what frequency in passing water?" Then, as a branch of that question, springing out of it, I ask whether the frequency is more by day or by night, or influenced by movement, or by any particular circumstance? How the question applies I will tell you afterwards.

Then, secondly, I ask whether there is pain in passing urine, and whether before, during, or after micturition? Inquire also if pain is felt at other times, and if produced or aggravated by quick movements of the body. The locality of the pain is also to be precisely ascertained.

Then I ask, as a third question, "Is the character of the urine altered in appearance, or is there anything unusual in the stream itself? Is the urine turbid or clear?" Possibly the patient will tell you that it is turbid, but you find, on questioning further, that it was passed perfectly clear, and only became thick after cooling or standing. Also, as arising out of this, you may often ask, "Does it vary much in quantity?" noting of course the specific gravity. The healthy standard, both as regards quantity and density, however, must be allowed very extensible limits, and both, I need not tell you, are very important elements in regard of renal disease. Then, as regards the stream itself, it may be small, forked, or twisted, or it may stop suddenly when flowing.

The fourth and last question is, whether blood has been passed in any way with the urine; whether the mixture is florid or brown, light or dark; whether the blood and urine are intimately mixed, or whether the blood is chiefly passed at the end or at the beginning of making water; or, lastly, whether it issues independently of micturition altogether.

After dilating on these inquiries and showing the manner in which, by their aid, the differential diagnosis of various diseases could be easily established, Sir Henry Thompson proceeded to describe

the methods and instruments necessary for prosecuting physical and other examinations of the patient and of his secretions.

## A Clinical Lecture

ON THE

## PHYSICAL EXAMINATION OF THE URETHRA IN CASES OF STRICTURE.

*Delivered at University College Hospital on November 18th, 1875.*

By Sir HENRY THOMPSON,

Surgeon Extraordinary to H. M. the King of the Belgians; Emeritus Professor of Clinical Surgery in University College Hospital.

(Reported by Mr. G. BUCKSTON BROWNE.)

GENTLEMEN,—To-day our subject is to be, stricture of the urethra. It naturally comes next in order; but I take it next also because it is generally supposed to be one of the most frequently occurring affections of the urinary organs. Not that it is so; on the contrary, it is certainly not present in a great majority of those who fancy they are the subjects of stricture. Many persons suffering from slight functional disturbance will come to consult you for "stricture." They do so because they find the stream a little twisted or forked, whilst nevertheless the urethra may be absolutely free from any organic change.

[After discussing the pathology and describing the symptoms of stricture, the lecturer proceeded to consider the mode of examining the urethra in order to ascertain the presence of stricture.]

For this purpose there are two separate modes to be followed, as there are two different objects to be attained, each of which is quite distinct from the other:—

There is, first, a simple examination of the urethra, to be used only for the purpose of verifying the presence or absence of any material deviation from the natural dilatability of the urethra;

And there is, secondly, a more minute and exact examination, in order to determine the precise condition of the urethra when it is already known, or there is reason to believe, that long-standing and perhaps considerable obstruction exists.

Now I need hardly say that the first examination is one which is applicable to the vast majority of cases; and that the second is necessary only in a few and exceptional cases. A very simple examination suffices to determine the question which so frequently comes before us—"Do certain not very considerable derangements of the urinary function in any particular patient arise from organic obstruction, and therefore require instrumental interference; or are they due to some other condition, for which instruments are not merely useless but would probably be injurious?"

Now, in reference to this subject, I find a tendency at the present day to employ instruments too readily, and instruments also which are liable

to injure the urethra. This over-readiness to interfere with the urethra existed at the beginning of the present century. The mechanical school, as I shall take the liberty to term those who devise and largely employ more or less complex mechanical means for exploration, and for applying dilatation, cutting, or caustic to the unfortunate urethra, was then in the ascendant. I think I could amuse you for hours with the history of the surgical knick-knacks which have been produced by it. But our time is too valuable, and I will content myself with one illustration only of surgical practice in this country at the era I speak of. [Sir Henry Thompson then read some curious reported cases from the work of Sir E. Home, illustrating the extraordinary abuse of the bougie at that time.]

Following the period spoken of came the experience of mischief as its result, and a certain healthy reaction appears to have taken place. The practice of Sir Benjamin Brodie, who was subsequently so high an authority during his long career, was marked by caution and prudence, and his admirable teaching ensured a similar practice among others for some time. I may be allowed to say, perhaps, that my feeble voice has also been raised against the abuse of instruments from the first day that I ventured to pen a line on the subject, some two or three and twenty years ago. And now I perceive a growing disposition to return to the state of things I have referred to. I note an increased tendency to discover stricture, and especially to undertake a considerable amount of operative treatment for strictures of the slightest kind, and sometimes where, in my opinion, they do not exist. There seems now to be a school which has determined for itself a very high standard of patency in what we hear called the "urethral tube," and which is accordingly said to have, or, if it hasn't, that it ought to have, a calibre of so many parts, and very large parts, of an inch, or millimetres, as the case may be. Instruments of astounding magnitude are produced, and if one of them cannot be drawn, with an ease which contents the operator, through the whole of the urethra, the unlucky patient is pronounced to be the subject of stricture; and probably he is submitted to an operation by no means devoid of risk.

Now I don't know that this fashion has as yet been adopted here, but I do know that it exists elsewhere, and I raise my earnest protest against it. I feel it a matter of duty on my part to say what I think about treatment which I am perfectly certain neither you nor I would for a moment entertain the propriety of in our own proper persons; that is, if we entertain a due respect for that delicate passage which an intelligent acquaintance with it will ensure. Let us for a moment revert to the natural form which the urethra takes when it is distended by some fluid material, and observe how unlike it is to the coarse simile of a tube of known uniform diameter. We have already seen that its natural capability for dilatation varies greatly at different points: being much limited at the junction of the membranous and spongy portions; limited again, but less so, and somewhat irregularly, in the anterior part; and again at or near the meatus. Let me assure you also that there are few structures more delicate than the male urethra. Formed of an internal membrane of great tenuity, surrounded by elastic and muscular fibres, interpenetrated everywhere with ducts, fine blood-vessels, and nerves; the whole surrounded in front

of the prostate with one of the most elaborate of vascular structures, known as erectile tissue; add to this the sensitiveness to pain of the internal membrane, equalling the conjunctiva in that quality, as anyone may learn for himself by passing the softest instrument he can find. Lastly, and more important still, it possesses another form of sensibility, of a much graver kind, which even the last-named membrane does not possess: I mean a strong tendency to arouse, in the entire nervous system, a state of excitement, evidenced by the striking phenomena of rigors and subsequent fever and prostration, when slight mechanical injury has been done to any portion of it. Now let this picture of the urethra as it is, never be absent from your mind's eye when you put an instrument into it, and both you and your patient will profit. When, therefore, a young man consults you for certain troubles relative to which you desire to learn whether urethral obstruction be a cause or not, do not be tempted for an instant to adopt so unnecessary a course (to say the least) as the introduction of very large instruments, or instruments with huge bulbs at the end of them. But simply take a flexible English gum-elastic bougie, well curved towards the point, with a blunt end (since a tapering point, of course, will not mark distinctly the site of stricture), not larger, as a rule, than No. 10 or 11 of our scale, and pass it very gently and slowly into the bladder. If it goes easily—above all, if it is withdrawn without being held, and slides out with perfect facility, take my word for it he has no stricture, and, *quoad* obstruction, wants no use of instruments whatever.

I dare say I shall be told by someone, that there may be a urethra through which No. 11 can be made to pass, yet which is, nevertheless, the subject of some degree of stricture which it is necessary to treat. Well, I do not deny the existence of that exceptional case. But such an example is very rare, and, further, no man who has the slightest delicacy of tactile sense in his fingers can fail to observe the difference between a No. 11 bougie sliding out with facility, and one which is grasped somewhat as it is withdrawn. This difference is always manifest in the two cases, and is, indeed, very notable. But supposing that the No. 11 stops at any point, and you have assured yourself that it is not one of the natural obstructions to the passage of an instrument through the urethra, of which I shall have to speak hereafter, you will try a smaller instrument of the same kind until you have arrived at one which does pass through and inwards into the bladder. But you may also test your observation by passing a soft tapering French bougie—11 or 12 English size,—and if it is a *natural* obstacle which at first checked your blunt-pointed bougie, the former instrument will probably slip through without trouble.

Now, with reference to these bulbous-pointed flexible explorers, nothing is more easy, especially with an unpractised hand, than to deceive oneself with respect to the existence of stricture by means of them. If not drawn out accurately in the axis of the passage, you may feel a check, and readily find what you believe to be a stricture in the most healthy urethra. And that is precisely what I am so anxious to guard you against; for, in the hands of designing persons, these instruments may be turned to most unworthy purpose. For men outside the ranks of our profession, or holding a

questionable position on its outskirts, these instruments are the very thing. That is an additional reason why we should be careful not to encourage their unnecessary use. I have used small bulbous instruments in metal for the diagnosis of narrow and confirmed stricture, on which it is desirable to operate, for twenty years, but for slight stricture never; and I have protested against their use on the two grounds already named: first, that for such the instrument inflicts needless pain; secondly, that it is liable to deceive a young operator not too adroit or familiar with its use.

But now, in the second case—not that of the young man, but of the patient who has a confirmed stricture,—the diagnosis has probably to be conducted with more attention to detail. I proceed as follows, making what may be called a “survey” of the passage. I commence by passing the soft, blunt-ended English gum-elastic bougie as far as it will go; and when this stops, as it may do within an inch or less of the orifice, I make a note of the distance, and next find what will pass with tolerable ease through the obstruction met with. Very likely a No. 4 or 5 (similar instrument to the preceding) will do so, and it may then be carried further to seek another check, which is not unfrequently met with at about five inches from the orifice. Through this, after a trial or two, a very small gum catheter—say No. 1 or 2—may probably be passed into the bladder, drawing off some urine, and so assuring you of its position. I know then the patient has, at all events, a narrowing near the orifice and another at the distance named. I may verify this at once with a bulbous instrument if I choose; but as long as the anterior narrowing exists, it is as well to postpone more minute research until it is divided, as considerable narrowing at that part always requires to be. Such a one, indeed, is never advantageously treated by dilatation. This being done, the No. 11 blunted bougie is passed, and we learn whether any contraction exists in the interval existing between it and the spot originally marked at five inches. If there is one, the stopping of the bougie will indicate its situation. But if the bougie passes easily to the point just named, the canal is sufficiently open, and we have arrived at what, in ninety-nine cases out of a hundred, is the only remaining stricture; for it is rare indeed, where a narrow stricture exists at that distance from the meatus, that any other will be found beyond. This has next to be dealt with, and, as we are speaking now of old and confirmed cases, there is little doubt that the best treatment will be internal urethrotomy. How to accomplish that most perfectly will be discussed in my lecture on that subject.

A word or two about the bulbous exploring instrument. It should, in my opinion, be of polished metal mounted on a slender metal rod or shaft. No other material slides so easily and smoothly through the urethra; and the necessity for it is, after all, not great, so that to employ one which produces much irritation, passes roughly, or distends unnecessarily, is to pay too high a price for the small amount of information it may convey. I am free to say that, although I used the metal bulbous instruments in the earlier part of my career, I can now, with more experience, attain all that is necessary without them. It is said that they enable you to ascertain the length of a stricture. In reference to this, let me tell you, first,

that considerable narrowing almost never affects the urethra for any great distance. The passage is often partially implicated for half an inch behind and half an inch before the maximum point of narrowing—an important practical point in relation to operation; but the very narrow spot, which is what the exploring bulb indicates, is almost invariably short, within a quarter of an inch in extent. Secondly, you must take into consideration the fact that the mobility of the mucous lining of the urethra will deceive you if you are not aware of it. A very little pressure in front, on entering the stricture, or from behind, in withdrawing the exploring bulb, if it comes rather tightly through, changes the situation of the contracted portion considerably in relation to its distance from the external meatus.

I repeat, then, if you have to deal with a recent stricture, such a one as you naturally intend to treat by dilatation, the introduction of a large bulbous explorer is wholly useless, only produces unnecessary pain, and tends to excite inflammation.

But in view of any internal incisions for a confirmed or obstinate case, the important thing is simply to know where the narrowed points of the urethra are, and then it is not difficult to apply your cutting instrument properly to them.

But, before proceeding further, I wish to show you the proper mode of passing an instrument through the healthy urethra into the bladder, so as to avoid error arising from certain sources of difficulty which are *naturally* found there, and are often mistaken for stricture. Were the urethra a mere tube of uniform diameter, these would not exist. We shall observe in the particulars of its unlikeness to a simple tube, that such natural obstacles do exist, and have to be avoided.

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## Original Papers.

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ON A CASE OF

### SIMULTANEOUS EMBOLISM OF CENTRAL RETINAL AND MIDDLE CEREBRAL ARTERIES.

By W. R. GOWERS, M.D.,

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SEVERAL cases of retinal embolism have been recorded in which there also occurred at some other time embolism of a cerebral artery. In the following case the two accidents appear to have been simultaneous. This rare coincidence, and the circumstance that a post-mortem examination enabled the diagnosis to be verified, render the case one of considerable interest. The patient was in University College Hospital, under the care of Sir William Jenner, to whom I am indebted for permission to publish my notes of the ocular condition, and the account of the general symptoms and of the post-mortem appearances, which are taken from the hospital case-book. It will be convenient to describe, first, the case in its general aspect; and, afterwards, the ophthalmoscopic appearances,



and the results of the microscopical examination of the eyeball.

C. H. H.—, aged thirty, carpenter, a healthy-looking man, was admitted Jan. 29th, 1870. In early life he had an attack of "low fever," attended by pains in the joints, followed by chorea and by weakness in his right arm. A year later he had a similar, less severe, febrile attack. During the six months before his present illness he suffered from cough, shortness of breath, and occasional slight hæmoptysis.

Without premonitory symptoms, he suddenly, when out walking, lost consciousness, was picked up insensible, and brought to the hospital. Soon after his admission he had partly recovered consciousness. There was then complete paralysis of the right arm and leg, and slight paralysis of the face. At the heart there was a loud systolic apæxmurmur, with accentuated pulmonary second sound, and evidence of dilatation of the left ventricle, the impulse extending outside the nipple line in the fifth interspace. The urine contained no albumen.

On the following day he had so far recovered consciousness as to be able to speak, but answered "Yes" to all questions, uttering no other word. He turned on his back when told, but opened his mouth when told to shut his eyes. His stools and urine were passed unconsciously.

Three days after his admission he still answered "yes" and "no" indiscriminately to all questions. The hemiplegia continued unchanged. A day later, when asked where he suffered pain, he answered "in the head," but when asked his name he answered only "yes, no."

In this state he continued for some weeks.

On February 21st it was noted that there was slight improvement both in limbs and speech. When the assistant, Mr. Price, went up to his bedside he attempted to say something, but only got out "ning." On Mr. Price suggesting "good morning," he immediately repeated it. When trying to converse with other patients, one of them began to sing a song, and while singing the first verse H— hummed it with him, and then took it up and sang the second verse by himself, articulating the words fairly well. Afterwards, however, he was able to speak no better than before.

In the beginning of March he became worse, began to vomit food and cough up blood. The heart's action became more feeble and irregular, so that the murmur could be heard only with a few beats of the heart. The legs became cedematous, that of the right being greatest, the right arm also. The urine contained blood. The paralysis of the face had increased a little, but he had become able to move the leg slightly as he lay in bed.

By the middle of March all the evidences of cardiac failure were more intense, and on the 20th he got some cedema of the left arm, with hæmorrhagic spots up to the bend of the elbow. Signs of effusion into the right pleura showed themselves. On the 25th the distension of the left arm became extreme, bullæ formed on the right foot, and hæmorrhage occurred from the nostril. He lingered until the 29th, when he died.

*Post-mortem examination.*—Brain: There was a little excess of fluid under the arachnoid, but no general flattening of convolutions. The ventricles contained no excess of fluid. The right hemisphere was healthy throughout. In the left hemisphere were two lesions. The smaller was an

area of softening on the outer surface of the left hemisphere, at the posterior part of the parietal lobe; it measured one inch by three-quarters. The two corpora striata presented a marked difference. The left was less full than the right, especially behind; the lining membrane of the ventricle over it was opaque, and the vessels too numerous; and at its junction with the optic thalamus it was softened over an area three-quarters of an inch in diameter, and of a yellowish color. On section the disease did not extend into the optic thalamus, but passed outwards to the fissure of Sylvius, the tint of the softened portion varying from creamy white to pale orange. Convulsions of the island of Reil destroyed; lowest frontal convolution a little damaged. The arteries at the base appeared healthy. The right middle cerebral contained fluid blood. In the left middle cerebral, within the Sylvian fissure, was a clot half an inch long, colorless, firm, easily detached near the orifice of the artery, but above adherent to the inner coats. On each side of the clot was a little fluid blood. Branches from this occluded artery passed directly into the diseased portion of the corpus striatum. The anterior cerebrals and anterior communicating arteries were empty. The heart was much diseased. The mitral orifice was thickened and roughened, and calcareous on its auricular surface. Old clots were contained in the auricular appendices and in the apex of the right ventricle. In the lungs were numerous angular patches of pulmonary apoplexy. Each kidney contained an infarct pyramidal in shape, the base on the surface. A similar infarct was contained in the spleen.

*Condition of eye.*—Four days after his admission into the hospital, and five days after the onset of the paralysis, an ophthalmoscopic examination was made for the first time. Only the indirect method of examination was employed. The fundus of the right eye was found to be normal. In the left eye the optic disc could not be distinguished, being veiled by a greyish-white cloud; its position could be noted by the convergence of the vessels. Another white cloudy opacity of considerable size existed in the retina near the yellow spot. Both these had soft edges, were moderately white, and the retinal vessels appeared partly concealed by them. The arteries were small, the veins large and distinct.

On the following day the appearances in the eye were nearly the same, the white opacity in the centre of the fundus being continuous with that near the optic disc. In front of the former a distended vessel crossed transversely just above the position of the yellow spot, and small twigs passing from this vessel at right angles on each side were abnormally conspicuous against the white background. On examination it was clear that he could not see with this eye.

During the next week these white patches gradually lessened, and the outline and surface of the disc became clear. As the vessels became more visible the diminished size of the arteries was distinct. By Feb. 18th the large white patch near the yellow spot had gone, leaving only a little irregular cloudy and granular whiteness. The optic disc was quite distinct in its inner portion, while the outer half was still somewhat hazy. A line of whitish opacity extended upwards and outwards towards the yellow spot, and, curving round and becoming fainter, blended with the traces of the mischief near the yellow spot. In

the first part of its course it accompanied a vessel. Below the disc was another limited opacity bounded on each side by a vessel.

The veins were all perceptible and tolerably uniform. The arteries were much narrowed on the optic disc for some distance around; they appeared mere threads. Not very far from the disc, at a distance variable in different vessels, but usually about twice the diameter of the disc, they again became conspicuous. There was a distinct darkish opacity of the retina all round the optic disc.

On March 1st the optic disc remained clear; the vessels, both arteries and veins, had diminished in size, the former, on the disc, being reduced to the merest threads. They were narrower at a distance from the disc than formerly. In one vein the column of blood was interrupted, for the vessel appeared as if empty for a little space.

On March 13th it was noted that the disc had become whiter, and its edges well-defined and clear, but a little uneven. The remains of opacity below and above the disc were still there, but less conspicuous. The veins were rather smaller than when last examined, and the diminution in size was chiefly noticeable near the disc, where they appeared considerably narrower than in the equatorial region. One small vein could not, with the indirect image, be seen close to the disc, but reappeared a short distance away. The arteries on the disc itself were just visible as lines, and some of them could not be distinguished against the choroid near the disc. All, however, became more perceptible at about two disc-breadths from its edge, and towards the equatorial region became much larger than near the disc, though smaller than when first observed. This condition continued until he died.

For microscopical examination, longitudinal sections of the optic nerve and disc were made, after hardening in weak chromic acid. The central artery in the optic nerve was dilated here and there, but for the most part so contracted that its calibre was reduced in places to a mere line. It was somewhat tortuous. The walls were thick, but only in proportion to the contraction of the artery. There was no complication of the inner layer. The dilated portions corresponded in some instances to the passage of a branch from the artery into the substance of the optic nerve. Just behind the division of the artery in the disc was a dilatation of some size. But in the disc itself, the main branches of the artery were reduced to very narrow dimensions, the cavity of one being only 1-2000 in. in diameter, and that of another reduced to a mere line.

Here and there, chiefly in the substance of the nerve, but to a less extent also in the disc, minute granular masses could be seen in the vessels. The largest of these, represented in the woodcut, was situated in the main trunk in the substance of the optic nerve, about one-eighth of an inch behind the lamina cribrosa. It is an elongated plug, 1-800 of an inch in length, and about 1-800 of an inch in width, coarsely granular in appearance, containing many dark points. It apparently did not quite fill the vessel, having doubtless shrunk from the sides while the specimen was being hardened. A little distance in front of this was a small spherical mass. Further back the vessel was for some distance reduced to a very narrow size, hardly any cavity being visible; but here and there a little granular mass could be noticed within it. Further back it

again widened out, and then narrowed. In one of the narrowed arteries on the disc a quantity of granular material could be perceived. The veins

Longitudinal section of central artery of retina, one-eighth of an inch behind the lamina cribrosa. On each side is loose cellular tissue, and beyond this the longitudinal nerve-fibres are indicated. Within the contracted vessel is an oval granular mass, and in front of this a smaller spherical body. Magnified 300 diameters.

on the disc were reduced in bulk, but were much larger than the arteries. No capillaries in the disc or about the lamina cribrosa could be perceived. In the retina beyond the limits of the disc, however, about a disc's breadth from its edge, numerous dilated capillaries could be seen, running inwards through the nerve-fibre layer, some vertically, others at an inclination. They appeared as if passing from the choroid to the surface of the retina; but they could not be traced towards the choroid beyond the cellular layers of the retina.

The nuclei in the optic nerve were not more abundant than normal, but the nerve-fibres showed some commencing degeneration, a few globules of myelin being scattered among them. The disc was not swollen, its height above the level of the choroid being within the normal limits. The minute round nuclei which commonly lie among the nerve-fibres in the disc were increased in number, and in places were accumulated in oval heaps between the bundles of nerve-fibres. The layer of nerve-fibres passing on to the retina appeared a little swollen; but its thickness, a disc's breadth from the edge of the disc, was only 1-300 of an inch, the fibres being here and there very slightly varicose, and lying less closely together than is usual. The cellular layers of the retina near the disc were in some parts normal, or nearly so, the ganglion cell-layer, the two nuclear and the inner nuclear layers being distinct, the former only in places a little thickened by the increase in the number of corpuscles composing them. (The layer of rods and cones was nowhere distinguishable as

such, doubtless from the time which elapsed after death before the post-mortem examination was made). On another side of the disc, however, probably where the opacity was noticed during life, the whole thickness of the retina was infiltrated with minute corpuscles resembling those of the nuclear layers. In these layers they were more closely aggregated, but they filled also the internuclear layer, and were scattered less closely through the molecular layer. The retinal layers were also a little sinuous. These changes were noted especially in the portion of the retina beneath the thickened nerve-fibre layer.

Near the macula lutea some irregularities in the surface of the retina could be noticed on looking at it with a simple lens. These depended partly on ramifying vessels and partly on the retina being raised in minute folds. The microscopical examination showed considerable though variable change. In some places all distinction of layers was lost; small round corpuscles resembling those of the nuclear layers, but staining less readily with logwood, infiltrated the whole thickness of the retina, the only other structure perceptible being the remains of the vertical fibres of the retina, themselves thickened, among which the nuclei lay. In other places the fibres of the internuclear layer (here, of course, always wide) were separated, spaces between them being left, and the nuclear layers being normal, as in simple oedema. In some places round corpuscles were scattered through this layer; in other parts the molecular layer was infiltrated with small round corpuscles lying amid a granular matrix. The external nuclear layer was also in places considerably thickened. Where the retina was raised in a fold, this layer on the concave side was sinuous, and between the contiguous folds the layer of rods and cones had disappeared, and the space was filled up by a considerable quantity of granular material, in which a few round corpuscles could be distinguished. The pigment epithelium was in this part in close contact with and adherent to the external nuclear layer.

*Remarks.*—There can be no question as to the nature of the case. The discovery of masses of granular material in the central artery and its branches, and the absence of any hæmorrhage around the vessel, the occurrence of undoubted embolism in the middle cerebral artery and in the kidneys and spleen, the correspondence of the retinal changes, vascular and parenchymal, to those observed in other instances of embolism, render the nature of the case unquestionable. The condition of the retina when first examined agrees closely with that observed in other cases a few days after the occurrence of embolism. Hence it is probable in the highest degree that the retinal and cerebral embolisms were simultaneous.

What was the position of the obstruction? I do not think that the plug figured can be regarded as that which effected the closure of the artery. Its size is not sufficient, and there is no narrowing of the vessel at the spot to account for the arrest of so minute a plug. The artery also was contracted behind it, and the contraction extended, with intervals of dilatation, as far back as the examination of the optic nerve extended, which was nearly, but not quite, as far as the entrance of the central artery into the substance of the nerve. The artery was traced, with the scalpel, from its origin from the ophthalmic as far as its entrance into the nerve,

and no plug was seen, but a microscopical examination of the vessel was not made. The numerous fragments of fibrin to be seen in the vessels of the nerve and disc show how much material must have been discharged into the vessel at the time of the embolism. It is probable that the chief obstruction was situated where the artery enters the nerve.

A ready collateral circulation must have been established, for the arteries, as seen with the ophthalmoscope, maintained their thread-like dimensions only for a very short distance after leaving the disc, and then resumed a distinct though diminished contour. The blood reached them no doubt from the posterior ciliary arteries. It is often assumed that the vessels of the disc form an important part of the means of communication. The opinion rests on the statement of Leber that the disc is supplied by the posterior ciliaries. But surely the marked and increasing pallor of the disc in this and in almost all cases of embolism is in contradiction to the assumption. An exception was the case of Wecker's,\* in which an obstruction of a branch of the artery was followed by increased vascularity of the corresponding portion of the disc. But the case stands alone. Pallor of the corresponding part of the disc is more common, as Mr. Nettleship has lately pointed out; and in a patient of Mr. Streatfield's, whom I saw some time ago, in which there was obstruction (doubtless from embolism) of one branch, with corresponding segmentary loss of sight, there was not a trace of increased vascularity in the corresponding portion of the disc. The pallor of disc in these cases depends, as Gradenigo† has pointed out, on anæmia, rather than on tissue proliferation. No capillaries were visible, although carefully looked for, in the case I have just described; and neither the tissue-formation nor the degeneration of the nerve-fibres was sufficient to account for the pallor. But there was distinct distension of small vessels in the retina outside the limits of the disc, and it is, I think, clear that it was by the vessels near the papilla, and not by those in the disc, that the collateral circulation had been set up.

The retinal appearances, as seen with the ophthalmoscope, do not differ in any material point from those of most other cases recorded. It is, however, to be noted that when first examined, five days after the presumed onset, the opacity of the retina was as marked around the disc as around the macula lutea. Moreover, the red spot at the macula lutea, so often described, was absent.

This fact is of interest in connexion with the diagnosis of embolism within the artery from hæmorrhage around it. The absence of a red spot at the macula and the presence of early infiltration around the disc are given by Magnus as diagnostic indications of hæmorrhage around the nerve. In the case now described, unquestionably embolic, the spot at the macula was absent, and by the fifth day the infiltration around the papilla was very marked.

The anatomical changes in the retina corresponded to the opacity observed during life, and still present, although in less degree, at the time of death. They indicate more structural change than is, I think, commonly supposed to occur in these cases. The adhesion of the pigmentary epithelium

\* Atlas, p. 149, note.

† Gottardi, *Giornale de Med. Mil.*, July 1875, p. 22.

to the outer nuclear layer may perhaps be taken as evidence that the destruction of the layer of rods and cones at this part was not a mere post-mortem change, but occurred during the active processes consequent on the arterial obstruction.

### CLINICAL ESSAYS.

By T. PRIDGIN TEALE, M.A., F.R.C.S.,

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#### NO. VI.—ON THE TREATMENT OF VESICAL IRRITABILITY AND INCONTINENCE OF URINE IN THE FEMALE BY DILATATION OF THE NECK OF THE BLADDER.\*

THE discussion at the late meeting of the British Medical Association at Edinburgh on Dr. Duncan's paper "On the Examination of the Female Bladder by Dilatation," and his testimony to the benefit resulting from the proceeding, and the extract from the *New York Medical Record*, Aug. 14th, 1875, "On the Cure of Cystitis by Dilatation of the Neck of the Bladder,"—warn me that it is time that I brought before the profession the observations I have made on the subject of this essay during the last eight years. The substance of the essay was read before the Leeds Medical Club in November, 1870, before the West Riding Medico-Chirurgical Society at Leeds in February, 1873, and before the Yorkshire Branch of the British Medical Association at a meeting at Scarborough in November, 1874.

About eight years ago the following case, of which unfortunately I cannot find any record, was under my care at the Leeds Infirmary:—A healthy-looking middle-aged woman had been for some time under treatment for great irritation of the bladder, accompanied with the passage of mucus tinged with blood. Having failed to relieve her by the usual means, I decided to dilate the urethra in order that I might introduce the forefinger into the bladder, and search for some explanation of the pain and bloody discharge, such as an ulcer or villous growth. No definite lesion was discovered; but, to my surprise, in the course of a few days, I found that she was completely relieved. She left the hospital, and I have not heard of her since.

This case struck me forcibly as parallel with the immediate relief which generally follows forcible dilatation of the anus for fissure and spasm of the sphincter; and I determined to profit by the hint. The result is, that during the last eight years the operation of dilating the neck of the female bladder as a means of cure of a distressing and unmanageable malady has been adopted in thirty or forty cases by myself and my friends.

In bringing the subject forwards I am met by three difficulties: the first, that I am proposing to treat a *symptom*, "irritability of the bladder," associated with a great variety of causes, and that, in applying a remedial operation, but little cognisance is taken of the cause of the symptom; the second is a consequence of the first, that the operation does not succeed in every case, and sometimes fails entirely; the third difficulty is this, that I have

not yet been able to establish any rule to guide us to the selection of the exact cases to which the operation is suitable. My justification, however, for proposing the operation in the face of such difficulties lies in the fact that it deals with cases which defy all other known methods of relief, which cause intense, prolonged, and often permanent suffering to the patient, and constant disappointment to the medical attendant, and that in a fair proportion of the cases, *perhaps in one third*, absolute cure has been obtained, not in my hands alone, but in the hands of many of my medical brethren who have adopted the operation. It is a sense of these difficulties, the not infrequent failure of the operation, and my own inability to define exactly the cases in which success is probable, which has made me hesitate hitherto to bring the subject before the profession.

#### A.—CASES IN WHICH THE OPERATION MAY BE PERFORMED.

The cases calling for the operation are those in which there has existed for some months pain at the neck of the bladder and too great frequency of micturition, with or without pus, mucus, or blood in the urine; or incontinence of urine, with a full bladder unable to empty itself completely, or with a nearly empty bladder which is intolerant of the presence of urine. The time for doing the operation is when all ordinary means of relief have been tried in vain, whether general or specially directed to the bladder, uterus, rectum, or kidney.

This definition may be said to embrace a very wide range of disorders, having in common the one symptom—irritability of the neck of the bladder. The fact is, the operation has been tried and has succeeded in a great variety of cases. In some successful ones there have been pain and excessive frequency of micturition, giving rise to a suspicion of stone in the bladder, with urine perfectly healthy, and in which, at the time of the operation, the finger failed to detect any fault in the mucous lining of the bladder. In other cases the urine has contained altered pus and mucus and blood, such as is usual where there is vesical calculus, and yet the operation has cured. In others, again, there has been an abundance of unaltered pus, settling in large quantities to the bottom of the vessel, which was afterwards proved to have been derived from a suppurating kidney or other extravascular source; and even in these the operation has given substantial though perhaps temporary relief. More than one case has proved this fact—*that pus from a source external to the bladder may give rise to distressing irritability of the bladder, with pain and excessive frequency of micturition, the bladder itself being apparently sound*; and that the vesical irritability may be cured—for a time, at any rate—by dilatation of the neck of the bladder, although the original cause of the irritability remains in force.

*Vesical incontinence.*—In two cases (Mr. Scattergood's and Mr. Horsfall's) a perfect cure, and in one of my own cases very great mitigation, of vesical incontinence has resulted from dilatation. In these cases I suspect that there is an over-sensitive state of the mucous membrane at the neck of the bladder, which, the moment an attempt is made to empty the bladder, sets up spasm of the vesical sphincter, and arrests the act of micturition after the escape of a very small quantity of urine, the bladder remaining nearly full and ready in a

\* Read before the West Riding Medico-Chirurgical Society at Leeds, February, 1875.

very few minutes to induce another painful and equally ineffectual attempt at micturition. Thus an overflow of a bladder disabled from correct micturition by irritability of its sphincter becomes an incontinence. Thus also the operation I have proposed by rendering the irritable sphincter vesicæ powerless for spasm, perhaps temporarily incompetent, allows the bladder to empty itself completely, and the cervical mucous membrane to recover its tone.

#### B.—OPERATION.

The patient being under the influence of an anæsthetic, Weiss's dilator is introduced into the urethra and dilatation continued until the urethra is distended so as to admit two fingers. The dilator ought to be passed as far into the bladder as possible, otherwise the branches of the instrument yield too much to the resisting neck of the bladder. It is desirable to dilate slowly, so as to avoid, *as far as possible*, laceration of the mucous membrane of the urethra. In many cases this laceration occurs, although due care has been taken, and much more after-pain results in consequence during the first day or two.

Sometimes instead of Weiss's dilator I have used the conical probe-gorget, designed by my father for median lithotomy, as a guide for the finger, by which the remainder of the dilatation is effected. On the withdrawal of the dilator it is generally found that the urethra still grasps the finger. The dilatation thus attained enables the surgeon to explore the interior of the bladder. Generally the bladder has appeared to be perfectly healthy, being soft and velvety to the touch throughout. Occasionally portions have been raised and indurated, as if ulcerated, but I have thought this sensation might be deceptive, and produced by the corrugations of an empty bladder. I cannot say that I have undoubtedly detected ulceration by the finger in any of these cases. In two or three instances it has turned out that the bladder was permanently contracted to a cavity little larger than a thimble.

#### C.—OBJECTIONS TO THE OPERATION.

(1) *Fatality*.—In three instances death has occurred within a short time of the operation. The first was a patient of my own and of Mr. Hodgson Wright of Halifax, who was excessively worn down by the sufferings of several years. The operation gave her much relief from pain, and was a great comfort to her, but her failure of health was progressive, and she died in about five weeks. At the autopsy it was discovered that the bladder was healthy, but that the pus in the urine came from the kidney. The second, a case of Mr. Wheelhouse's, was a child about four years of age, who had been relieved a year before by this operation, Mr. Wheelhouse having introduced the finger into the bladder for the purpose of exploration, and having thereby arrested the symptoms from which the child was suffering. A year later the child returned to the hospital with a lapse of the vesical symptoms. The operation was repeated, this time as a means of cure, not of diagnosis, and the child died in a day or two. At the post-mortem it was found that the bladder was healthy, and that the pus causing the symptoms came from a diseased kidney. The third fatal case was under Mr. Jessop. A young woman, worn down by vesical trouble and incontinence of urine that had existed since childhood, was submitted to the operation.

The introduction of the finger found the bladder contracted to the size of a large thimble. She died in the course of a few days, and at the post-mortem strumous degeneration and suppuration of the kidney was found. I think I have heard of another fatal case, but I am not certain.

It may be said that these fatalities are an argument against the operation. To me they seem to be the reverse—a reason why cases of this class ought not to be allowed to drift year after year into this broken-down condition, in which a comparatively trivial operation can extinguish the feebly sustained vitality. It rather raises the question suggested by Mr. Charles Smith, of Halifax, whether the disease of the kidney may not have been induced by the prolonged vesical irritation.

(2) Another objection may appear in the possibility that *the source of the irritation may not be in the bladder itself*, but may be pus entering the bladder from the kidney or some other extraneous source. The fatal cases of my own, and of Mr. Wheelhouse, already referred to, prove that the discomforts of the irritability of the neck of the bladder may be suspended or relieved by the operation, although the irritability may have originated in a cause external to the bladder.

(3) A third objection may be raised in the *danger of producing incontinence of urine*. My first idea about the operation was, that by producing *temporary incontinence of urine* we might so set at rest the vesical structures that any ulcerated or abraded surface might heal, that morbidly irritable or hypertrophied sphincter-fibres might lose their excessive irritability, and that any unhealthy condition of urine resulting from an imperfectly emptied bladder (as occurs in the male from enlarged prostate) might, by its freedom of escape, regain its normal character. This was my original idea—namely, to produced incontinence. And I was induced to believe that any incontinence would be temporary by what I had seen of the removal of large-sized calculi in the female with rapid recovery of vesical competency. It has happened, however, that the operation was rarely followed by any incontinence of urine, and many of the most rapid and most complete cases had not even temporary incontinence. On the contrary, instead of relieving the bladder every few minutes or every hour, they were able to retain their urine the greater part of the night immediately following the operation. Other cases, again, had incontinence of urine for a few weeks. One case for a few months had very little power of retaining urine and then recovered completely, the pain and irritability having been relieved from the first. Two cases that I know of have suffered from permanent incontinence of urine. It does not, however, appear that the liability to permanent incontinence depended upon the degree to which the dilatation was carried.

(4) *Relapses*.—In Mr. Wheelhouse's case the cause of relapse—suppuration of the kidney—was revealed by the post-mortem. In one of my own cases the operation of dilatation had been performed by Dr. Bell, of Bradford, to the extent recommended in my paper read at Leeds, but without relief. A few months after Dr. Bell and I dilated again more freely to the extent that would admit three fingers. After some days of incontinence she recovered power over the bladder. From passing urine every ten minutes or a quarter of an hour with groans, she was able to relieve her-

self without pain, and though not cured, she is only disturbed five or six times each night. In two other cases the operation was repeated, and I believe both are comparatively well, having occasionally slight attacks of pain, with increased frequency in micturition. This, however, may be said, *that a relapse or the failure of a first operation ought not to deter us from giving a second trial.*

#### D.—LITERATURE.

I have failed hitherto to find any authors who have proposed this or any similar treatment for affections of the female bladder. The nearest approach to it is the proposal of Sir James Simpson (mentioned shortly after his death by Mr. Lawson Tait) to cure irritable ulcer of the bladder—in other words, severe vesical irritation—in the female, by establishing a temporary vesico-vaginal fistula. His object was to obtain, what I aimed at by dilatation—physiological rest for the distressed organ. In works on female diseases the treatment of this distressing condition is generally dismissed in a few words. From the article referred to at the beginning of this paper it is clear that the Americans are at work in the same direction, and the case quoted is a strong confirmation of the correctness of the principle of treatment here advocated.

No less a confirmation is the advocacy of Dr. Duncan of dilatation of the neck of the female bladder as a means of exploration, and the testimony of his patient to the indirect benefit derived from it. Further confirmation of this principle may be drawn from the fact that Mr. Syme treated somewhat similar cases in the male by incising the neck of the bladder as if for lithotomy, and from the rapidity with which the inflammation of the bladder produced by a calculus subsides under the free drainage established by lateral lithotomy.

(To be continued.)

### ON A FATAL CASE OF BLOOD-POISONING OF UNCERTAIN NATURE, PRESENTING SEVERAL UNUSUAL CHARACTERS.

By DYCE DUCKWORTH, M.D., F.R.C.P.,

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THE case of which the following particulars are subjoined was one presenting several features of remarkable interest, and it therefore deserves publication. It seems, indeed, not an easy task, judging purely by its clinical characters, to place it in any clearly defined nosological category; but the nearest approach to such an attempt has been made in the title given above. Mr. Steele of Reigate, under whose immediate care the patient was, has kindly supplied to me the early history of the case.

X. Y., aged twenty-one, a slightly built, fair-haired gentleman, on the 26th September, 1875, began to complain of a noisy barking cough, and of some occasional spasmodic difficulty of swallowing. The day following he sought Mr. Steele's advice for these symptoms, and he further complained of some fulness about his neck. That

gentleman at once detected an enlargement of the thyroid gland, and, finding no other physical signs, attributed the troubles described to that particular affection. Mr. Y. had never been robust, but had had no illness of any importance till four years previously, when he had a severe attack of typhoid fever. During the summer he had been somewhat overworked, and had not had sufficient holiday relaxation. The swelling was ordered to be painted with tincture of iodine, and a mixture was given containing three-grain doses of iodide of potassium in an ounce of infusion of gentian. Confinement indoors was also enjoined. It was noted that the action of the heart was somewhat feeble; pulse about 60; the skin was cool, and the appetite fairly good. The patient contrived to amuse himself in his room, and did not feel unwell. In the course of a few days the inspiration became gradually rather noisy, but was not difficult; and there was slight "brassy" cough, with the expectoration of a little grey mucus. The voice was also hoarse.

On the 10th of October I saw the case for the first time with Mr. Steele, and confirmed the above conditions. The thyroid body was then uniformly enlarged, symmetrical, hard, and firm. The finger could not be passed into the sternal notch. The lymphatic catena on the right side of the neck was enlarged, but not, or very slightly, upon the left side. There were no other enlarged lymphatic glands upon the body. The thyroid gland was only a little tender upon manipulation, and the integument over it was tense, cool, and non-adherent. The pulse was 60 per minute, regular, and the action of the heart was feeble. The tongue was a little furred, and a mawkish taste in the mornings was complained of. The bowels were comfortably relieved. The stomach was rather irritable, and there was a tendency to nausea. The chest was everywhere resonant on percussion, with the exception of some slight dullness under the manubrium of the sternum. The breath-sounds were modified generally by an apparently conducted tracheal note, but they were more shrill in the right suprascapular and infrascapular regions. The voice-sounds in these situations were also louder and more bronchial than on the left side.

Two small flattened tumours were found on the abdomen on the left anterior lumbar region, dusky-grey in hue, rounded and well-defined. They were tender when pinched up, and were distinctly in the integument. These had been observed for about ten days. The legs were natural in all respects. The spleen was not at all enlarged, and the liver was of normal dimensions. There had been a little soreness of throat and oedema of the uvula, and painting with equal parts of tincture of perchloride of iron and glycerine had been practised for relief of this. The urine was natural in quantity and appearance. The patient got up each day, and changed his room. No dysphagia, or very little, was complained of, but there was some irritability of stomach, and also occasional tendency to faintness and retching.

It was decided to increase the iodide of potassium to five grains for a dose, and to give as much of the carbonate of ammonia with it in infusion of gentian. The thyroid swelling was still painted with tincture of iodine.

On the 18th October there was no marked change, but some coryza had occurred, and the iodide was evidently ill-borne. About this time paroxysms of

pain were complained of, issuing from the right side of the seventh cervical vertebra and shooting into the front of the right shoulder. At times these attacks were very severe. Opiates were given every four hours for the relief of this pain, and with some benefit. The nights were bad and the attacks of pain and retching were more frequent at night. The ointment of biniodide of mercury was now rubbed into the thyroid swelling. One application of this, however, caused vesication, and no more was employed. The breathing continued noisy, and at times there were short paroxysms of dyspnoea together with the attacks of pain and retching, requiring semi-erect posture in bed. The cervical glands continued to enlarge a little. During the two following days no decided change occurred. The pain still proved very annoying, and persisted in the same situation, and the faintness and retching continued. Usually a little bilious mucus was brought up. About the 15th October it was distinctly to be observed that the swelling of the thyroid gland was diminished and the whole organ was softer and less tense than before, perhaps even softer than a healthy gland, but the enlargement remained of symmetrical character, and there were still signs of tracheal and bronchial pressure as before. Some grey pearly masses of mucus were brought up after coughing, but the cough was not at all urgent. On the 17th October the pulse was 60, feeble; temperature normal; urine natural in appearance and void of albumen. The blood was examined microscopically, and the proportion of white cells was found to be normal, the red globules forming healthy rouleaux. The same dulness, and no more, was found at the manubrium on percussion, the resonance being good elsewhere over the chest. Air entered well into both lungs, but the respiration was markedly shrill and tubular, both in front and behind on the right side, less so on the left. The voice had a bleating character to bystanders, and on auscultation was bronchophonic over the upper half of right side. The thyroid body remained in about the same condition as when last noted—viz., uniformly enlarged, elastic, and symmetrical. The pain persisted in precisely the same situation. The patient directed attention on this day to some swellings upon his head, and on examination two firm node-like tumours were found upon the left parietal region, and two more upon the upper frontal region. These were situated in the pericranium, were only a little tender on pressure, but did not ache otherwise, and never at night. They had been noticed about a week previously by the patient himself, but he had not mentioned them.

Mr. Savory was invited to the consultation on the evening of this day, and he made a minute examination of the patient. It was decided to give quinine in three-grain doses every four hours, and to push the nourishment and wine more vigorously.

On the 18th October dorsal decubitus was no longer possible. The pulse was 72; respiration 14 in the minute, and noisy. The tongue was covered all over with a thick dirty-white fur. No material wasting was observable. The quinine was well borne. A bad night ensued. On the 19th, at 9.30 A.M., the pulse had risen to 90, was soft, but of fair volume. Respiration 20 in the minute. No fresh glandular enlargements to be

felt. The spleen was natural as to size. Air entered both lungs well; breath-sounds very shrill. Tongue still more coated, and senses of smell and taste lost. The nares were dry, and inspiration through them impossible, though expiration could be managed. The attacks of pain became more frequent and severe, the sensation being compared to a feeling of dislocation. Some whiffs of chloroform were inhaled with slight relief to the paroxysms of dyspnoea. At 6 P.M. the pulse was 88; temperature 98.4° in axilla, 98.6° under the tongue. Two glands in the left groin had become enlarged and painful during the day, and the axillary glands were also somewhat enlarged. Strong beef-tea, eggs, and port wine were given as freely as possible. The quinine was increased to four grains and a half, with fifteen minims of tincture of perchloride of iron added to each dose. The pain now recurred at shorter intervals with increased severity, and was scarcely relieved by anodyne and hot fomentations. At midnight fifteen grains of chloral hydrate were given. Oct. 20th, at 1 A.M., a severe paroxysm of dyspnoea occurred, accompanied with retching. The respiration was very noisy (roaring) and rapid, like that of severe spasmodic asthma, and the distress increased. The shoulders were supported, fanning was employed, and some chloroform was given to inhale. Stimulants were also administered. No relief was afforded. The lips became more and more dusky, and the arms were thrown about wildly. Respiration ceased almost suddenly. Silvester's method of artificial respiration was practised for about fifteen minutes, and brandy was injected into the rectum. All efforts were in vain.

No post-mortem examination was obtained.

*Remarks.*—The illness just described lasted in all about four weeks. The family history afforded no clue whatever to the nature of it. The patient resided in a healthy country district, and had been, so far as was known, exposed to no insanitary or malarious influences. The earliest symptoms were, perhaps, referable to some irritation of the pulmonary branches of the vagi nerves. A condition of low health and feebleness had been reached for some time previously. The first coarse nutritional derangement to be recognised was a hard but uniform enlargement of the thyroid gland; and for some time most of the symptoms appeared to be due to this as a source of mechanical disturbance. Thus the altered respiratory sounds and voice and the peculiar cough seemed to be accounted for. This enlargement gradually progressed, and the cervical lymphatic system likewise became involved. These changes, however, could not be set down to any form of inflammatory growth, neither were there any indications of their being dependent upon tubercular, syphilitic, or cancerous cachexia; for the conditions present, and the history obtained, negatived all these hypotheses. Together with the involvement of the lymphatic glands, certain changes occurred in the integument over the abdominal wall and in the pericranium; and the physical signs in the chest afforded strong presumptive evidence of enlargement of the bronchial glands. At no period was there any splenic enlargement, and throughout the case there was absence of pyrexia. The blood also presented no signs of leukaemia. Death by apnoea evidently ensued upon mechanical irritation of the pneumogastric nerves. The final paroxysm of dyspnoea,



like those which preceded it, was accompanied by simultaneous retching and partial syncope.

In the absence of an autopsy, the primary cause underlying these processes has to be sought. To anticipate a view which might perhaps plausibly be held after a consideration of the facts of the case—viz., that the symptoms betokened the presence of a malignant tumour of the anterior mediastinum or of the thyroid body itself,—the fact may here be restated, that the latter organ became soft and yielding towards the termination of the case, and at no period presented any unevenness or evidence of involving other adjacent structures. Such conditions seem to be quite incompatible with the rapid spread of a malignant growth into or around the texture of this gland.\*

No more reasonable explanation offered itself than that which was adopted—viz., that, owing to some peculiar form of blood-poison, the lymphatic system, in a large measure, including the thyroid gland as a part of it, became involved, and, by mechanical interference with certain nerves, gave rise to the varied symptoms which occurred, and which eventually caused death at a somewhat early period in the case. The integumentary and pericranial tumours may likewise be referred to the same cause.

It should be noted that the paroxysms of dyspnoea were not due to uncomplicated laryngeal spasm. There was never present pure stridor of laryngeal quality, and although it is not possible to aver that there was no such element in the dyspnoea, the characters of the respiratory trouble indicated the existence either of bronchial obstruction due to spasm, or, more probably, of spasm mixed with and dependent upon direct pressure from enlarged bronchial glands. Hence there never was any likelihood of affording even temporary relief by tracheotomy, for the obstruction was manifestly intrathoracic and beyond reach, and, further, the mechanical tension at one period exercised by the enlarged thyroid body had ceased to exist for some days before death. Had the thyroid gland continued to enlarge, and cause increased local pressure, an incision into the mesial line to relieve this might have been indicated. Direct compression by the gland upon the recurrent laryngeal nerves could hardly have proved more urgent towards the end of the case, but these branches may have been, and probably were, pressed upon by enlarged intrathoracic glands. The pain was, no doubt, of neuralgic nature, and due to pressure of glands upon a part of the brachial plexus.

Neither iodide of potassium nor quinine appeared to exert any beneficial influence upon the morbid process, and medical art was powerless to avert the bitter and untimely end of this remarkable and most distressing case.

Grafton-street, W.

\* My colleague, Dr. Andrew, has reminded me of the opinion held by the late Dr. Southey Warner, of St. Bartholomew's Hospital, that cancerous growths often progress without exciting any pyrexia; and, so far, in this case this observation might have lent support to the view of malignant disease, but for other and weightier reasons this supposition could not be entertained. See also Wunderlich on Temperature.

#### A SHORT ACCOUNT OF

#### EIGHT CASES OF ACUTE TUBERCULOSIS, WITH SPECIAL REFERENCE TO THE PRESENCE OF CASEOUS CENTRES OF INFECTION.

By H. M. TUCKWELL, M.D., F.R.C.P.,

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EVER since the promulgation in this country of the doctrine that acute miliary tuberculosis depends on, and follows directly from, the presence of caseous centres in some part of the body, I have examined every case that has come under my observation with special reference to this important question. I propose to narrate the following cases in as short a form as possible, omitting for the most part any account of the symptoms, and merely giving a brief description of the post-mortem examinations.

CASE 1.—January, 1867. Girl, aged nineteen. Tubercular meningitis. The lungs, spleen, liver, and kidneys contained miliary tubercles. The peritoneum was unaffected. In the middle of the upper lobe of the right lung was an old vomica of the size of a walnut, with thick walls, smooth lining membrane, and cheesy contents.

CASE 2.—February, 1868. Woman, aged twenty-three. Tubercular meningitis. A few miliary tubercles were scattered through the upper lobe of the right lung. The spleen, liver, and kidneys exhibited all the appearances usually present in cases of blood-poisoning, but contained no tubercles. The right Fallopian tube was dilated into a sac filled with cheesy pus. The left tube contained a smaller quantity of the same matter. There were signs of old peritonitis, with adhesions, in the pelvis, propagated from the diseased tubes; but there was no trace of tubercle in the peritoneum.

CASE 3.—March, 1869. Man, aged twenty-six, admitted with angular curvature of the spine and paraplegia, but without any acute symptoms. After having been in the infirmary for two weeks, he became rather suddenly attacked with feverish symptoms and cough. His temperature rose steadily, his breathing became more and more distressed, his face dusky, and he died at the end of a week from the beginning of the acute symptoms. After death the brain was found to be unaffected. Both lungs were crowded with minute miliary tubercles; the upper lobe of the right lung was hepatised. The spleen was large, soft, and rotten. The liver was likewise large and swollen. Six of the dorsal vertebrae had their bodies carious, and separated from their periosteum by a thick layer of cheesy matter.

CASE 4.—February, 1870. Boy, aged four. Tubercular meningitis. The lower lobes of both lungs were congested and thickly strewn with very fine miliary tubercles. No other organ was affected. One bronchial gland was enlarged and caseous. One small cheesy collection, of the size of a pea, surrounded by a thin capsule of investing fibrous tissue, was found in the lower lobe of the left lung.

CASE 5.—August, 1871. Boy, aged fifteen. Tubercular meningitis. Both lungs were stuffed with miliary tubercles. The liver contained many tubercles on its surface and in its substance. The



spleen was swollen and thickly strewn outside and inside with the same formations. One gland, of the size of a cobnut, with soft, putty-like contents, lay beneath the right sterno-clavicular articulation. The thickened capsule of the gland had ulcerated through at one spot and suffered the soft contents to escape into the surrounding tissue.

CASE 6.—May, 1873. Man, aged twenty-one. Tubercular meningitis. Both lungs were stuffed with miliary tubercles. The liver was covered on its upper surface, and strewn throughout its substance, with the same tubercles. The spleen contained many of the same, as also the peritoneum covering the diaphragm, which was thickly beset with them. At the root of the right lung, and surrounding the right bronchus, was a cluster of large caseous glands, some of them softened and of the consistence of putty. Mesenteric glands enlarged and caseous.

CASE 7.—April, 1874. Girl, aged fourteen. Tubercular meningitis. Miliary tubercles were sparsely scattered through both lungs. The peritoneum was sprinkled with a few similar tubercles. One small cheesy nodule, of the size of a pea, was imbedded in the lower lobe of the left lung, and surrounded by a thin capsule, which had at one part ulcerated through. In the immediate neighborhood of this spot the tubercles were much more thickly scattered than in any other part of the lung.

CASE 8.—September, 1875. Girl, aged ten. Tubercular meningitis. The lungs were stuffed with miliary tubercles. A few of the same were scattered over the peritoneum. At the root of the lungs, surrounding the bronchi, was a mass of enlarged and cheesy bronchial glands. The mesenteric and lumbar glands were much increased in size, many of them caseous.

The evidence afforded by these cases seems to be, on the whole, corroborative of the German doctrine above mentioned. In all of them caseous stuff, in greater or less quantity, was found. In Cases 4 and 7 the apparent insignificance of the supposed centres of infection deserves notice. It may well be asked, Is it possible that a spot in the lungs no larger than a pea could bring about so deadly a train of symptoms, and, in the course of two or three weeks, sow the body with miliary tubercles? To this it may be answered, that the fact that the tubercles were thickly clustered round the spot in question, and seemed to radiate from it in all directions, is a fair reason for believing that this little degenerate mass may really have been the focus of infection; and this belief is further strengthened by a reference to the inoculation experiments of Villemin, Simon, Sanderson, and others, which will show how minute a speck of cheesy matter, introduced into the body of the animal experimented on, is sufficient to determine a widespread dissemination of miliary growths.

A second difficulty that presents itself, and seems to militate against the acceptance of this doctrine, is how to account for the fact that caseous glands, withered remains of former abscesses, and other collections of the kind, are often met with in post-mortem examinations without any accompaniment of miliary tubercle. It will be found, however, in all these degenerate remains of former inflammations, that the cheesy matter is surrounded by a capsule of greater or less thickness. The slowness of progress in the inflammation, which is presupposed by the very presence of caseous changes,

gives rise to gradual thickening of the investing capsule in glands, of the surrounding fibrous tissue in old vomices or "residual abscesses"; and thus constructs a boundary-wall of protection which shall prevent future devastating excursions of this dangerous degenerate matter into the surrounding tissues or into the blood. It seems probable that, were it not for this mode of protective isolation by the natural encapsuling of degenerate products, many who are now walking about in apparently good health would have become long ago the victims of acute miliary tuberculosis. And here it may be allowable to turn aside for an instant to the subject of pyæmia and pyæmic centres, which, from this point of view alone, not to speak of other manifold resemblances, offer in their relations a striking likeness to tubercle and tubercular centres. It is well known to surgeons that abscesses in certain parts of the body are very likely to be followed by pyæmia. A very small and seemingly insignificant purulent centre, provided that it hold a certain relation to the surrounding tissues, may sow the body with multiple abscesses, and destroy life in a time which can be reckoned by days rather than weeks. In illustration of this reference need only be made to the acute periosteal abscesses of young persons. I have put up in the Oxford Museum a preparation of secondary abscess in the walls of the heart, from a boy who, after an illness of ten days, died of pyæmia, with secondary deposits in many of his internal organs, consequent on an abscess, not larger than a walnut, between his clavicle and its periosteum. I have also seen the same thing happen on two other occasions, where the small primary abscess lay between the tibia and its periosteum. On the other hand, large collections of pus, which may be even putrid, can form in the body under other conditions and with other surroundings, and not give rise to pyæmia. What are these conditions? This question has lately been handled by Mr. Savory in the columns of *THE LANCET* for January of the present year. He submits that the explanation of this difficulty is to be found in the fact that the abscesses which do not infect "are bounded everywhere by a layer of new structure, which is, or has the character of, granulation tissue, and that this liminary membrane, when sound and unbroken, resists the passage of fluids through its substance into the blood." He alludes also to Billroth's experiments, which show that granulation tissue, when healthy, has this power of resistance. Now, may we not see here a parallelism between the investing granulations of an abscess and the investing fibrous tissue of a caseous centre? Let but an "accidental breach" in the investing abscess-wall occur, and the body is pyæmic. Let there but be in the cheesy centre a breach through the surrounding fibrous capsule to form a way into the circulation for the degenerate matter, and the body is smitten with acute tuberculosis. In Cases 4 and 7 it will be noticed that the investing capsule had been apparently opened by ulceration, and the soft contents suffered to escape into the surrounding tissue. Dr. Hermann Weber\* has recorded some striking cases of the same kind.

Lastly, it may be pointed out that only occasionally can a direct spreading by contiguity from the caseous centre to the neighboring tissues, and from thence a gradual infection of more distant parts or

\* Path. Soc. Trans., vol. xxi., p. 14.

organs, be demonstrated. The tubercles may often be found at a distance from the centre, as if the infection were rather by way of the blood than by direct extension through the tissues.

### CASE OF NYSTAGMUS OCCURRING IN A COAL-MINER, ASSOCIATED WITH PALPITATION AND PROFUSE SWEATING.

By BYROM BRAMWELL, M.B.,

Physician and Pathologist to the Newcastle-on-Tyne Infirmary.

THOMAS L—, aged thirty-eight, a pitman, married, was admitted to the Newcastle-upon-Tyne Infirmary on the 10th of June, 1875, complaining of dimness of sight, palpitation, and debility.

*Previous history.*—He has worked as a coal-miner for twenty years, and has been particularly healthy. Has never had syphilis nor rheumatism. For the last four years he has suffered occasionally from palpitation. Eighteen months ago he first felt his sight dim, and noticed when he looked at an object intently that it seemed to move quickly backwards and forwards. The palpitation and dimness of sight have been worse since March, and since this date he has felt short of breath on exertion. He thinks the dimness of sight was brought on by the glare of the lamp which miners use. The pitmen, he says, often complain that the light hurts their eyes; he never, however, knew anyone affected in the same manner as himself.

The family history is unimportant.

*Present condition.*—He is a pale man, tolerably well nourished, but not muscular. The pupils are equal, contracted, and sensible to light. When he fixes the eyes on an object, the eyeballs oscillate quickly backwards and forwards with a slight rotatory movement. The oscillation is greatest when he looks upwards or to the right. It is also increased by looking at distant objects. It is not increased by a dim light, and is not worse when he assumes a stooping position. He states that the nystagmus is worse since he left off work. When at work he used to look chiefly downwards and to the left. On ophthalmoscopic examination the fundus is seen to be normal.

The thorax is well formed. On palpation a very marked systolic thrill is felt in the first and second left interspaces, just outside the sternum. The percussion note is impaired over the same area, the dulness being best marked between the second and third left costal cartilages. On auscultation a loud systolic murmur is audible over the area of thrill. Its point of maximum intensity is at the middle of the sternum, on a level with the third costal cartilage; from this point it is propagated upwards over the area of thrill to the left sterno-clavicular articulation. The murmur is unaccompanied by a second sound. At the second right costal cartilage and over the course of the aorta, the murmur is heard, but much less loudly. There is no venous hum in the neck. Pulsation and thrill can be faintly felt when the finger is placed deeply in the suprasternal notch. The murmur is just audible in the left suprascapular

region. The radial pulse numbers 72; it is equal in the two wrists, full and regular. There are no pressure signs. Every three or four days, sometimes more frequently, the patient is attacked with violent palpitation; the attacks last from a few minutes to half an hour; they occur at all times of the day, and without any apparent cause. The slightest exertion causes profuse sweating. The sweating sometimes comes on when he is at rest, and always follows the attacks of palpitation. The appetite is fair; tongue clean. The temperature in the axilla is 97° F. The other systems and organs are normal. There is no enlargement of the thyroid.

Five minims of tincture of digitalis and ten minims of the tincture of the muriate of iron were ordered three times a day.

June 21st.—Since patient's admission it has been noted that the pupils are frequently unequal, the right being sometimes smaller, sometimes larger than the left. The sweating is sometimes confined to the left side of the face. The temperature on both sides is the same. His general condition is unchanged.

July 3rd.—An attack of palpitation came on to-day in my presence. It commenced at 12.30. The eyes became slightly prominent; the pupils considerably dilated; the cardiac pulsations numbered 144 in the minute. The face was slightly livid; the extremities cold. The patient stated that the attack was a very slight one. At 12.35 he said he would try and "put it away." He took two deep breaths and said, "It is away." At the same moment the pulse fell from 150 to 60 in the minute. Slight pain over the front of the chest was complained of while the palpitation lasted. The patient says when it goes away he feels the heart give a sudden jump, and the pulsation immediately ceases. He can always "put it away" by taking one or more deep inspirations. Sometimes the attack continues for half an hour before it is stopped. The digitalis and iron to be discontinued. To take two minims of liquor arsenicalis thrice a day.

15th.—Was made an out-patient to-day as he had to go home to attend upon his wife who is ill. The liquor arsenicalis has produced no effect, although the dose has been increased. To discontinue it, and to take half a drachm of the liquor ergoti instead.

Aug. 26th.—Was readmitted, as he has been much worse of late. The palpitation and sweating have been most intense; the oscillation of the eyeballs is less; he can now look steadily forwards, downwards, and to the left; when he looks upwards, or to the right, it always commences; when the eyes are at rest, vision is good; his physical condition is otherwise the same. To take one-eighth of a grain of sulphate of atropia three times a day, and twenty grains of bromide of potassium every six hours.

Sept. 10th.—A violent attack of palpitation came on at 11.10 to-day; the cardiac pulsations numbered 174; the murmur was inaudible, its place being taken by a short rapid pulsation; the radial pulse was small and thready; the extremities cold; the eyes were prominent and staring, the pupils dilated; the respirations numbered 28. He made several attempts to "put it away," but did not succeed till 11.20. He then said "It is away." The pulse at the same moment became full and steady (72 in the minute); the murmur at

the same time became loudly audible; no irregularity nor intermittency was observed before the fall. To take half a drachm of the bromide three times a day.

25th.—Says he feels a good deal better; the attacks of palpitation are less frequent and less severe; he has gained four pounds in weight since his readmission; he feels weak and shaky about the legs, but otherwise well; the sweatings are much less profuse. To inhale nitrite of amyl during the paroxysms.

Oct. 1st.—The patient went out to-day greatly improved. The nitrite of amyl completely controls the paroxysms. He said on his discharge, "I wish I had had that medicine sooner."

*Remarks.*—Dr. C. Bell Taylor, of Nottingham, has reported several cases of nystagmus occurring in coal-miners, and states his belief that the oscillation of the eyeballs was in these cases a sort of chorea, brought on by strained efforts of vision in an imperfect light. This case agrees with those reported by Dr. Taylor, in so far as the patient is a miner and that he suffers from nystagmus. It differs, however, in the following essential points:—1st. The nystagmus is associated with other symptoms—viz., palpitation, loud systolic murmur, and profuse sweatings. 2nd. The oscillation of the eyeballs is not increased by an imperfect light, nor when the patient stoops. 3rd. It is worse when he looks at distant objects, and when he looks upwards or to the right. 4th. It is not easily curable; for it still continues, although he has been off work for seven months.

We know so little as to the cause of nystagmus that it is impossible to say whether the oscillation of the eyeballs, the palpitation, and the other symptoms of this case were associated as a mere coincidence or not. I am inclined to think their relation was not merely accidental.

In some particulars the case resembles exophthalmic goitre—a disease in which there is good reason for believing the cervical sympathetic to be at fault. Certain facts in this case point in the same direction, and show that the palpitation was due to stimulation of the accelerators of the heart, and not to suspension of the inhibitory functions of the vagus. These facts are—1st. The variable state of the pupils, the right being sometimes larger sometimes smaller than the left. 2nd. The profuse sweatings, sometimes unilateral. 3rd. The condition of the patient during the attacks of palpitation—notably the prominence of the eyeballs, dilatation of the pupil, and coldness of the extremities. 4th. The marked benefit which resulted from the use of nitrite of amyl—a drug which acts by dilating the vascular system.

It is a remarkable fact that the patient was able to "put away the beating" by taking a few deep breaths. This was no doubt due to reflex stimulation of the vagus. Here again is another fact in support of the theory that the palpitation was due to stimulation of the accelerators, for it is unlikely that the vagus would be so readily aroused if its inhibitory functions were suspended.

The instantaneous manner in which the attacks of palpitation ceased is worthy of note. The pulse, from being 174, thready, and almost imperceptible, became *all at once* full, regular, and of normal frequency. There was no stoppage for several beats, no irregularity before the fall took place—facts which were observed by Dr. Farqu-

harson in his lately published "Case of Unusually Rapid Action of the Heart."

The characters of the murmur were peculiar. At first I was of opinion that it was hæmic, and in the pulmonary artery. Against this view were the dulness on percussion, the very marked character of the thrill, and the absence of venous hum. I am now inclined to think that the murmur was due either to organic disease of the pulmonary artery or more probably to some congenital malformation.

## TWO CASES OF THORACIC ANEURISM.

By FREDERICK ENSOR, M.R.C.S.,

Surgeon to the Provincial Hospital, Port Elizabeth, South Africa.

To the physician who is alive to the insidious nature of thoracic aneurism, no cases cause more anxiety than those which exhibit symptoms of this grave organic lesion. I imagine in every hospital of seaport towns "cases" from the shipping are admitted which often puzzle the keenest and most painstaking observer. Men who are dissatisfied with their ship or captain, or who are attracted by diamond-fields or stories from gold-fields, will try every ruse to keep in hospital, but directly the vessel is out of sight their recovery is marvellously quick. When a man tells the usual tale of having pains here and there, and at the same time his pulse and temperature are fairly normal, or perhaps the former a little quickened by his "intent to deceive," and there be no marked symptoms of rheumatism, or expression of malaria or syphilis, you cannot but suspect him of malingering; and yet he may be the subject of grave internal mischief, causing immediate danger to life. I always like to give a man the benefit of the doubt, and watch and wait for a few days rather than act on a diagnosis which one may have cause to regret.

From manuscript notes of a clinical lecture on a case of aneurism of the aorta, by Dr. Todd, in 1855, I copy the following: "When patients above the age of thirty come to consult you about pains extending over the shoulders and chest, an aneurism should always be suspected." All King's men who had the good fortune to study disease at the bedside under that master in diagnosis, Dr. Todd, will coincide with me that it was a privilege and a treat to see him grapple with a difficult case of heart disease or aneurism: the repeated careful examination; the appreciation of, to us students, trifling symptoms; the patient watching of the man as he perhaps sat on his bedside; and the feeling that the *vita*, or vital force, or mind, as his disciple, Dr. Beale, would say, was stirring the depth and breadth of his "cerebral bioplasm," as it strove to solve the "enigma of life" in question, had a good effect on the class, and I dare say has made not a few strive to follow in the steps of so great a teacher.

The aid to diagnosis, which I quote from the clinical lecture, has been well illustrated in two cases which have come under my observation in this hospital; one occurred some two years ago, the other a few days since. As necessity of care

in diagnosis is the only point I wish to lay stress on in these cases, I will not enter into much detail.

The first case was that of a sailor—I write from memory. He was a tall man, rather thin, aged about forty, and was admitted complaining of pain, not very severe, of a neuralgic character, in the spine and about the chest. The captain "thought he was scheming." He had been under medical treatment for same symptoms; no diagnosis had been distinctly given; he was suspected of trying to get rid of his ship.

I examined him several times and got at no positive symptoms to guide me, and yet there was something in his look which told of suffering, and made one feel that the man's pains were not imaginary. He had been in hospital about a week when I detected a prolonged sound, not amounting to a "bruit," at the back, between the shoulders. I gave a guarded diagnosis of aneurism of the thoracic aorta. A few days after, in the act of lighting his pipe, he fell dead at his bedside, and the post-mortem examination disclosed a circumscribed aneurism of the descending aorta, which, having eroded two or three of the vertebrae, had given way and filled the left pleura with blood. When men are admitted who, without a doubt, are "sea lawyers," I generally order a few doses of sulphate of magnesia, flavored with tincture of assafoetida, and I find that they soon ask permission to leave the house. In the post-mortem room I felt glad I had not ordered the "stimulant mixture," as we term it, in the above case.

The second case, which occurred a few days ago, was the following:—A tall, thin, big-boned man, formerly a private in the German Legion, was admitted complaining of pain lancinating in the line of the intercostal nerves and lower part of the chest. No murmur at base or apex of the heart. Pulse even in both radials; no dulness over the middle of the sternum; no marked dyspnoea. The only thing I could detect was a limited dulness about the middle of the left lung, with rather harsh respiratory sounds; no cough or expectoration; pulse and temperature normal. The man was, nevertheless, conscious of something serious the matter with him; his eyes were particularly bright, the sclerotic pearly and clear.

At first I thought he was a dyspeptic "loafer" trying to remain in hospital. A thought of tubercle being laid down crossed my mind, but the pulse and temperature were against this idea. I remarked to the house-surgeon, "that it was not improbable we should find an aneurism in this case." After a careful examination, I could come to no conclusion, refused to commit myself to a diagnosis, and simply ordered him to remain in bed. No medicine was prescribed.

Two days after this, while engaged in an operation for crushed foot, the nurse entered the room, saying the German was "in a fit," as she called it. As soon as the operation was completed, on proceeding to the ward, I saw the poor fellow lying in bed, quite dead, with extreme pallor on his face. He had evidently died in a faint. The following day a post-mortem examination revealed an aneurism about the size of a turkey's egg in the descending aorta, which had eroded the seventh and eighth vertebrae, and had burst, filling the pleura with blood. The heart was small, and thin and pale in its muscular structure. The aortic valves were somewhat thickened, but not incompetent; the mitral valve was also thickened a little,

but, I imagine, had been equal to its office, or we should have had more dyspnoea. Both lungs were hyperaemic, the left slightly consolidated at its contact with the aneurism.

These two cases illustrate well how cautious one should be in coming to a conclusion in a case. A harsh judgment, a wrong diagnosis followed by harmful treatment, would always be a matter of extreme regret to the physician, and, in some cases, might give rise to much social distress. Better that a scheming patient should impose on his doctor for a few days than that a poor fellow with thoracic aneurism should be hurried to his end by active treatment on a wrong diagnosis.

In Trousseau's "Clinical Medicine," vol. i., p. 597, is a case well illustrating the point I wish to impress in these few remarks.

#### CASE OF HIGH TEMPERATURE IN RHEUMATIC FEVER TREATED WITH THE WET PACK.

By T. CARLETON RAILTON, M.B. Lond, F.R.C.S. Eng.

ELLEN G—, aged twenty, a housemaid, after having complained for two days of not feeling very well, and of pain in her right wrist, was sent to bed on June 25th, 1874, with all the symptoms of rheumatic fever. The pulse was 100, full and soft; both wrists were painful, and slightly swollen, and there was a copious perspiration, having the usual sour odor. The only treatment adopted at this stage was an opiate mixture to relieve the pain, together with the wrapping up of the affected joints in cotton wadding.

On June 26th the pain in the wrists had become more severe, and was accompanied by pain in one knee and in the back. The temperature taken at 10 A.M., in the axilla, was 102° F. Upon auscultating the chest, a mitral regurgitant murmur, soft in character, was perceived; this was treated by the application of one of Rigollot's mustard leaves over the cardiac region, followed by a constant succession of hot linseed-meal poultices.

June 28th.—The pain in the joints, although diminished in the wrists, had become intensified elsewhere, both knees and one ankle being somewhat swollen. Since the 26th the mustard leaves had been reapplied to the chest as frequently as the patient could bear them.

29th.—On being raised up in bed the patient fainted. The pulse still remained 100, but was very soft and compressible. A freshly prepared infusion of digitalis was ordered, together with certain fixed quantities of nourishment and stimulants at frequent intervals.

30th.—The faintness still continued; other symptoms remained the same.

July 1st.—The same symptoms. Temperature at 7 P.M. 108°. At night she began to ramble in her speech. Cold water cloths were kept constantly applied to her head.

2nd.—Rambling continued. Ice to the head.

8rd.—The rambling had turned to loud delirium, the carotids beating fiercely. The temperature at 4.30 P.M. being found to reach 105.7°, the wet pack was resorted to for the first time. A sheet

was soaked in iced water and wrung out; the patient was then enveloped in it from head to foot for the space of half an hour, at the end of which period the thermometer showed an abatement of the temperature to  $104^{\circ}$ , and so far from appearing exhausted by the process the patient appeared considerably improved; the pulse, though still 100, being firmer, while the violent excitement had given way to a comparatively sound sleep. At 11 o'clock the same evening these good effects had passed off, but the temperature still continued at  $104^{\circ}$ . The wet pack was applied for the second time in the same way as before, with the result of a descent in temperature to  $102^{\circ}$  and a tolerably quiet night.

4th.—At 10 A.M. the temperature had again risen to  $104.5^{\circ}$ , and the patient still continued to ramble. After another half hour in the wet pack, the temperature went down to  $101.8^{\circ}$ ; pulse 100; respiration 28. At 11 P.M. I was hastily sent for. The woman appeared to be sinking and almost unconscious; the pulse was very rapid and weak; the temperature was  $104.2^{\circ}$ . So great was the bodily prostration that I feared to have her lifted from the bed to the couch upon which the wet sheet had been spread, therefore, as an alternative plan, a large bath towel wrung out of iced water was tucked around her as far as possible without disturbing her. Stimulants and beef-tea were constantly administered. At the end of five minutes the towel was changed for a freshly-iced one, and in five minutes more a third was applied, the whole process thus occupying the space of a quarter of an hour, with the result of a descent in temperature to  $103.4^{\circ}$ , and a pulse much firmer and slower.

5th.—At 2 A.M. the bath towels were again applied as before to the front of the body, reducing the temperature to  $102^{\circ}$ . At 4 A.M. the process was repeated, but without observation as to the temperature. The patient was afterwards sponged over slowly with iced water from head to foot at intervals of an hour until 11 A.M., and by this means the temperature was maintained at  $102^{\circ}$ . The pulse (102) at this time was very much firmer, and the patient appeared calmer and more collected than she had been during the previous five days. The ice to the head was discontinued. The sponging was renewed for a quarter of an hour at 7 P.M., and also at 11.45 P.M., at which time the temperature was found to be  $101.4^{\circ}$ .

6th.—At 9 A.M. the patient, though still suffering considerable pain in some of her joints, was perfectly composed, and the marked depression from which she had previously suffered had passed off. Her pulse was 92; the temperature  $100.4^{\circ}$ .

Since the last date she gradually but slowly returned to comparative health, with but one slight relapse of the affection of the joints, unaccompanied by any great increase of temperature. The period of convalescence was naturally prolonged by the existence of the valvular disease of the heart, and by a very severe bed sore, but at the present time she is well enough to perform all the ordinary duties of her station.

In this brief record of (what was to me) a most interesting case, I have designedly omitted many details, as not bearing directly upon the object I have had in view in reporting it. It is evident that the application of cold to the body in cases where the temperature of the blood rises to a pitch

at which it imperils the action of the heart (threatens its paralysis in fact), is as justifiable a course in rheumatic fever as in any other.

Old Trafford, Manchester.

## CASE OF FIBROID TUMOUR OF THE MASSETER MUSCLE.

By KELBURN KING, F.R.C.S.,

Surgeon to the Hull General Infirmary.

JOHN S—, aged thirty-two, was admitted into the Hull Infirmary on March 2nd, 1872, under the following circumstances. For two years he had noticed a hard swelling in the region of the left temple, which extended down to the back of the left cheek. It was of slow growth, but as it grew he became unable to open his mouth, and, after the end of six months, he could separate his jaws only sufficiently to admit the thickness of a match. Latterly he had lost even this slight power of separation. His jaws were immovably fixed, and he lived entirely by suction through interstices between the teeth. He followed his employment as a laborer in a ship-building yard as long as he could, but of late he became so weak through insufficient nourishment that he was compelled to leave his work and apply for relief.

On admission, a hard lump, about the size of a damson plum, was felt in the centre of the masseter muscle, and another less distinct in the temporal, about an inch above the zygoma. The tumours had the feeling of enlarged, violently contracted muscular masses. Thinking it possible that the disease might depend on hypertrophy and permanent contraction of the muscles, I immediately administered chloroform, and, that failing to produce any relaxation, I divided the masseter subcutaneously. A certain amount of relief was afforded, and the jaws could be separated so far as to admit the patient's finger.

This mitigation was not permanent. On March 8th the closure was again complete. Chloroform was administered, and subcutaneous section of both muscles was performed. Some temporary relief followed, but the advantage gained was lost by degrees.

It was now evident that some other proceeding must be resorted to for his relief. The swelling was now most marked in the temporal region, and I resolved to remove the zygomatic process, so as to relieve the tension of the masseter, and get access to the insertion of the temporal muscle.

Accordingly on May 1st I performed the following operation:—An incision was made over the zygomatic arch, from the prominence of the cheek bone to almost half an inch in front of the ear. Another incision was made at right angles to this, extending about an inch above and below it. The flaps were dissected back, the masseter divided from the lower and the temporal from the upper margin of the zygoma. The bone forceps were then applied to the anterior and posterior extremities of the arch, which was removed. The insertion of the temporal muscles into the coronoid process was thus brought into view. The process was nipped through with bone forceps, and the muscle lifted up and dissected out. A hard

dense structure was found in the centre of the muscle, which was freely removed. Four vessels required ligature.

Great improvement followed this operation, though I was myself disappointed with the results. The hard mass in the masseter continued, but the man could eat meat cut small, and was himself satisfied with his condition, and left the house on June 1st.

He again presented himself on June 24th with his jaws firmly closed, in the same condition as when he first applied for assistance. The temporal region presented a flattened appearance from the removal of the muscle, but the hard substance was still felt in the belly of the masseter.

I determined to remove the masseter, and, if necessary, to disarticulate the bone and remove the whole ascending ramus. On the 26th June, chloroform having been administered, an incision was made from the angle of the jaw to the cicatrix of the old incision over the zygoma, which was again laid open. The flaps having been dissected back, the masseter muscle was dissected away from the bone and removed. The ramus was thus laid bare, but it was found irremovably fixed by numerous strong fibrous connexions with the neighboring bones. It seemed as if every part of the temporal muscle which had escaped excision had been converted into fibrous or tendinous structure, which held the bone firmly in its place. Under these circumstances I determined to remove the bone, which was done by dividing it from the last molar tooth to the angle by means of saw and bone forceps, then freeing it from its connexions, and disarticulating its head from the glenoid cavity. The wound healed favorably. He could open the mouth well, and left the hospital in a few weeks able to masticate freely on the right side.

I saw the man lately, and he continues quite well.

Mr. Plaxton, the pathologist to the infirmary, made several microscopic examinations of the tumour and muscular substance, and the following is his report:—"The tumour on section showed that it was not distinctly marked off from the healthy muscle, the greater part of masseter and temporal muscles being converted more or less perfectly into a hard creaking mass. The microscopic examination showed that the muscles were in process of conversion into fibrous tissue; isolated muscular fibres were to be seen between thick bundles of wavy fibrous tissue."

The muscular substance is not often the seat of disease. Though recurring fibroid is said to be frequently reproduced, it does not often originate in it. Mr. Tatum mentions a case in which he removed two recurring fibroids from the masseter and temporal muscles, but there was no train of symptoms such as I have related; neither was there anything of a recurring nature in these tumours, there having been no previously existing tumour, as in Mr. Tatum's case.\*

I consider, therefore, that this is a specimen of a very rare form of disease, and in the absence of any precedent to guide us as to treatment, I believe that nothing short of the extreme measure finally taken would have afforded relief. The man masticates only with the right side of his mouth, but he can open the jaws perfectly, and is now healthy and in good condition.

## NOTES OF A CASE OF EMPYEMA.

By REGINALD G. ALEXANDER, B.A., M.B.,

Physician to the Bradford Infirmary.

THE following fatal case presents some interesting features in consequence of the destructive ulceration which took place soon after paracentesis thoracis had been performed, and which destroyed, in several parts of the chest, the intercostal muscles, the pleura costalis, and skin, leaving large holes through which three fingers could easily be passed and the thoracic viscera reached and touched. This state of things lasted for more than a month, with much less constitutional disturbance than might have been expected.

The patient, M. N—, came to consult me in March, 1872, after an illness of six weeks, during which he had complained of anorexia, cough, night-sweats, and loss of flesh. He spoke in a hoarse whisper, and had, in fact, all the symptoms of laryngeal phthisis; but under appropriate treatment (chiefly directed towards improving the general health) he recovered, gained many pounds in weight, declared himself quite well, and continued so until the 18th of December, when, after exposure to cold, he awoke in the night with acute pain in the left side, rigors, and dyspnoea so severe as to prevent him from calling his friends. Unfortunately he did not at first call in his medical attendant, and he only came under my notice on Jan. 11th, 1873, when he complained of pain in the left side and dyspnoea. The left side measured an inch and a half more than the right; the whole lung was dull upon percussion, and there was total absence of respiratory murmur throughout its whole extent. Temperature 101°; pulse 106. Linseed-meal poultices ordered, and a saline diaphoretic with compound tincture of camphor, from which great relief was obtained; but paracentesis thoracis could not be performed as the patient lived in an out of the way district.

Jan. 19th.—A sudden accession of pain with rigors came on (the symptoms pointing to the formation of pus within the cavity), and distinct fluctuation being felt at a spot two inches to the left of the left nipple and four inches below it, a trocar was introduced (the opening being made valvular), and three pints of pus were discharged, without causing the least faintness, dyspnoea, or other bad symptom. The temperature at the time of operation was 101°, pulse 120, and very feeble. A large quantity of pus was discharged into poultices, and objection was raised to washing out the pleural cavity. Iodide of potassium, quinine pills, and cod-liver oil were ordered. The appetite of the patient and his general condition improved considerably; the cough was slight, with mucous expectoration.

Feb. 2nd.—The patient declared himself better, and could lie on the right side; slight cough; appetite good; temperature 101·2°; pulse 180.

9th.—The discharge continued; patient weak, but appetite good; temperature 102°; pulse 130. The discharge became very offensive, and an ulcerative process commenced, which destroyed the pleura costalis, intercostal muscles, and skin, progressing from within outwards, and ultimately producing several large holes on the anterior surface of the left side of the chest, through which the finger could be easily passed.

\* For Mr. Tatum's case, see Holmes's System of Surgery, vol. iii., pp. 639, 640.

March 3rd.—The ulceration advanced; the right leg became oedematous and an enormous size. Ordered warm sponging, a diuretic mixture, and the raised position for the leg.

16th.—The oedema of the leg disappeared entirely; temperature 101°; pulse 180, very feeble and sharp. Ordered wine, milk, eggs, all of which the patient took well.

30th.—Aphthæ in the mouth. Ordered the glycerine of borax, and an acid mixture of dilute nitro-hydrochloric acid with tincture of nuxvomica three times a day.

April 3rd.—Aphthæ gone; temperature and pulse high; the holes in the chest-wall increased in size; three fingers could easily be passed into the thorax and the viscera touched. The pus had a gangrenous smell, but the breath was untainted.

7th.—Ulceration extended; *the ribs left bare*, and the cartilages exposed to view; *the lung plainly visible*. The patient ate and slept well, and declared that "but for the holes in his chest" he would soon be well. He began to spit pus. Temperature 102°; pulse 180.

10th.—The tissue-destruction increased; appetite good, but the patient began to despair of recovery.

11th.—Became suddenly worse; intense pain in both sides of the chest and abdomen; possibly perforation of the diaphragm. He died after twelve hours' great suffering. No post-mortem examination could be obtained.

*Remarks.*—The patient had always a bad aspect, but apparently a strong constitution, and it was a matter for regret that objection was raised to the introduction of a drainage-tube and the frequent washing of the pleural cavity with warm water containing Condry's fluid, &c., which might have prevented the gangrenous ulceration and caused the case to terminate favorably, as in two instances which have subsequently come under my notice. It is curious, however, to note how long a person can live in the sad condition to which this young man was reduced, and the practical deductions to be derived are—1. That there is little risk to the life of the patient, and small amount of discomfort experienced by him, in the operation of paracentesis thoracica, even when performed by a simple trocar and canula in place of the aspirator, and at a point of the chest by no means the seat of election. 2. That the danger of the free admission of air into the pleural cavity has been overrated in its *rapid evil effects* upon the vital powers.

Bradford.

#### CASE OF

### GUNSHOT WOUND (BY DERRINGER PISTOL) OF CHEST AND ABDOMEN.

#### AUTOPSY AND REMARKS.

By RICHARD BARWELL, F.R.C.S.,

Surgeon to Charing-Cross Hospital.

A. B., aged twenty-one, shot himself with a Derringer pistol about 11 o'clock on the night of Nov. 14th, 1875. Dr. Reece saw him immedi-

ately after the injury, and directed his removal to Charing-cross Hospital. I was sent for, and arrived a little before 12 o'clock that night.

The young man had been sick instantly on receipt of the injury, and was in a state of considerable though not severe collapse. A round black wound, about the size of a sixpence, from which trickled down a drop or two of dark-colored blood, lay over the cartilage of the left eighth rib about four inches from the sternum. No probe could be passed into this opening save for a few lines immediately below the skin, in a direction upwards and outwards. He complained of no pain except at the left acromion, where it was severe.

The Derringer is a very small toy-like weapon, about five inches and a half long, with a bore of four-tenths of an inch in diameter. It is a breech-loader. The cartridge consists of a copper cap, into the open end of which the conical bullet fits, the detonating powder being, of course, at the closed end. The fulminate is of very powerful quality, and a certain specified charge is put into each cartridge. No other propellant is, I am informed, ever added.

Finding, however, at the wound no passage inwards, I thought it well that a search should be made in the young gentleman's clothing, and elsewhere in his lodgings for the bullet, but nothing was found either there or among the undigested portions of food which he had vomited.

Nov. 15th.—This morning the collapse was deeper; he had been constantly thirsty, taking ice in lumps, brandy-and-water, and was also frequently vomiting. I again failed in passing any probe, and explained to my class that the bullet had in all probability passed through the cartilage, which had then closed again behind it like a trap-door. He complained of inability to pass urine, though the nurse said he was constantly doing so. There was no blood either in this excretion nor in the vomit. About 8 P.M. that evening he suddenly had a greater fit of vomiting, and the matter seemed to contain a little blood. He almost instantly died.

*Post-mortem* (Nov. 18th).—The body was much swollen, and the skin much discolored, though there was less decomposition in deeper parts. The wound still refused to admit a probe (of course no force was used). On taking away the front of the chest the bruising and blackening was seen to occupy a greater space on the internal than on the external surface. For a long time no opening marking the track of the bullet could be found, although the pericardium, lungs, &c., were examined with the utmost care. At last a small slit was found in the diaphragm with no mark of bruising or extravasation around it. It was barely a third of an inch long, and only to be detected on very careful search. Of course this led into the abdomen, and on opening that cavity a little hole in the stomach was found, and on its posterior wall another; both these openings had a very narrow dark edging of extravasation. Removing the stomach, all trace of the bullet was lost; neither on the fat behind that organ nor elsewhere could any opening be found. The kidney was now removed, and in its upper and inner edge, just in front of the suprarenal capsule, a small crack or chasm was found, the extreme margin of which was blackened by extravasation. Behind the kidney, after careful search, a little split or rift was found in the fascia covering the psoas; it was not stained by effused



blood. The probe when passed into this ran backward and a little upward, and on dividing the parts the bullet was found imbedded behind the muscle just above the transverse process of the second lumbar vertebra, its conical end directed almost directly upwards. On trying the bullet on the blackened spot on the eighth costal cartilage, it was found that by exercising rather considerable pressure it could be made to pass through a hole formed by three convergent rifts, which, instantly after the passage, snapped together again like the flaps of a valve, and left no hole nor perceptible trace of passage.

It appears to me that this case is of interest as exemplifying the fearful power of the little pistol—a thing which a man might conceal easily in his clinched fist, and which looks less formidable than many a child's toy; yet it propelled its shot all but through a full-sized man; and, as I saw, it will send a bullet nearly through an inch-thick oak board, shattering to a great distance the wood around its place of exit.

The next singular point is the very little injury the bullet did to the traversed tissues. The wounds in such vascular organs as the stomach and kidney had a dark margin of bruising less wide than the hem of a lady's handkerchief; but parts less richly supplied with blood showed merely minute slits where the bullet had passed, and among fat, as that round the kidney, no track could be found at all.

The symptom, a prominent one throughout, pain at the acromion, must, I think, be ascribed to wound of the diaphragm; the strangury to wound of the kidney.

George-street, Hanover-square.

## SUCCESSFUL CASE OF TRACHEOTOMY IN A CHILD TWO YEARS OLD.

### NEW FORM OF TRACHEOTOMY TUBE.

By W. E. PALEY, M.R.C.S., &c.,

e-Surgeon to the Evelina Hospital for Sick Children.

THE following case seems worthy of record, partly on account of the tender age of the patient (two years), and because a new form of tracheotomy tube was used, which appears likely to be beneficial in many cases.

Ada L.—was admitted October 5th, 1875, into the Evelina Hospital, under the care of Dr. F. Taylor. A week previously she was taken suddenly ill with sore-throat and feverishness. There had been, however, no difficulty of breathing until the day before admission.

When admitted there was evidence of considerable laryngeal obstruction. The respiration was noisy, and there was marked laryngeal cough, with sucking-in of the intercostal spaces. Air could be heard entering both lungs fairly well, and the chest was resonant throughout. No diphtheritic membrane could be seen, nor did the urine contain albumen.

The patient was at once placed in a steam tent, but towards evening the symptoms became more urgent, and it was decided to perform tracheotomy. This I accordingly did, without chloroform, introducing an ordinary silver tube. Great relief of all

symptoms was immediately afforded, nor was there any recurrence of the dyspnoea.

The details of the progress of the case for the few days immediately succeeding the operation present nothing worthy of special note. Subsequently several attempts were made to dispense with the tube, but without success.

At the expiration of a fortnight the silver tube was changed for a new kind of tube suggested by Mr. Morrant Baker, the details of which were carried out under my direction by Mr. Milikin, of St. Thomas's-street. The tube is single, of ordinary tracheotomy shape, and constructed entirely of flexible india-rubber. It could be inserted easily without a pilot, and did not require to be changed more than once in every two days. As far as could be judged from a single case, it was introduced with less pain, was more comfortable to the patient, and caused far less irritation than a metal one; and with some slight modifications now being made it will, probably, prove a useful instrument.

I may add that the tube was worn for one month, during ten days of which the child was running about the ward; and we were able to discontinue its use altogether on Nov. 22nd, since which date the patient has left the hospital well.

So far the tube is not proposed by Mr. Baker as a substitute for a metal one at the time of operation, but to obviate the many well-known disadvantages the latter has when required to be worn for more than a few days. But it is not unlikely that, in many cases, the elastic tube might be used with advantage throughout, as there would probably be little or no difficulty in its introduction, at the time of operation, with the help of a proper pilot or forceps.

## A Mirror

OF

## HOSPITAL PRACTICE,

BRITISH AND FOREIGN.

*Nulla autem est alia pro certo noscendi via, nisi quamplurimas et morborum et dissectionum historias, tum aliorum, tum proprias collectas habere, et inter se comparare.*—MORGAGNI *De Sed. et Caus. Morb.*, lib. iv. Proœmium.

### ST. BARTHOLOMEW'S HOSPITAL.

COMPOUND DEPRESSED FRACTURE OF SKULL; PARALYSIS OF RIGHT ARM ON SIXTH DAY AFTER RECEIPT OF INJURY; ELEVATION OF DEPRESSED PORTION OF BONE; RECOVERY WITH USEFUL ARM.

(Under the care of Mr. THOMAS SMITH.)

THE following case, for the notes of which we are indebted to Mr. Edward Milner, surgical registrar, illustrates some of the difficulties that occasionally present themselves during the treatment of depressed fracture of the skull in children without primary compression. The majority of the best authorities agree that in any case of depressed fracture of the skull, but especially when it occurs



in children, the proper course to pursue is not to interfere with the depressed portion of bone if there be no symptoms of compression. It will be observed that in the subjoined case the symptoms of compression did not show themselves until the sixth day after the accident. Sudden paralysis of motion and sensation then appeared, and other symptoms of brain-pressure gradually supervened. The line of practice to be adopted was clear. Accordingly, Mr. Smith elevated the depressed bone and let out a quantity of pus and disorganised brain-matter. After this the patient progressed satisfactorily. There is, however, another point of interest in this case—namely, the great and persistent lowering of the temperature in the paralysed limb. As a rule, in such cases the temperature is not more than one or two degrees below normal, and tends to rise to the healthy standard in a few days. In this case the paralysed limb remained about 6° F. below the normal for many weeks.

Edward N—, aged six, a previously healthy boy, was struck on the left side of the head by a heavy piece of wood which had fallen from a third-storey window. On admission on the evening of June 8th, immediately after the accident, he was found to have sustained a contused and lacerated wound of the scalp, about an inch and a half in length, and situated about the level of, but slightly anterior to, the left parietal eminence. At the bottom of the wound a depressed portion of bone could be distinctly felt, the point of a probe being stopped against a distinct ridge when passed over the line of fracture. There was no paralysis of any part of the body. Patient was very sick and somewhat heavy, but quite conscious, and understood everything said to him. There was no bleeding from the nose, mouth, or ear, and only very slight bleeding from the wound. Pupils equal, slightly dilated, and acting readily to light; breathing noiseless, regular, and natural.

June 9th.—Is quite conscious, and understands what is said to him. Has been sick since admission. Is not noisy, but very restless and irritable, and constantly calling out. Had no sleep last night. Pupils equal and acting to light; temperature 98.2°; pulse 78, irregular in force and frequency; respiration 23, natural.

10th.—Restless and irritable, throwing himself about in bed, and constantly crying out. Still very sick; indeed can keep nothing whatever upon his stomach. Slept badly. Bowels not open since the accident. Pulse 96, good volume, more regular; temperature 98.8°; respiration 20. Wound looks well; very free discharge of somewhat offensive pus. To take ten grains of chloral hydrate in an enema.

11th.—Bowels open very freely this morning; still sick, but not so sick as in the previous twenty-four hours; still very irritable and restless, calling out constantly when awake, and throwing off the clothes; pupils equal, acting readily to light, slightly dilated; has kept nothing upon his stomach in the way of food since admission. Respiration 28; temperature 98.4°; pulse 112, regular, but feeble and compressible. To be fed every four hours by an enema composed of two eggs and a pint of beef-tea.

12th.—Very much better; much less irritable; no more sickness. Temperature 99°; respiration 24; pulse 108, much better volume and quite

regular. Slept well; bowels open; very free discharge from the wound.

13th.—Much better; slept well after ten grains of chloral hydrate; no more sickness; takes food well by the mouth.

14th.—Slept well; much more quiet, and apparently very much better until 9.30 A.M., when complete paralysis of motion and sensation of right arm suddenly occurred. Up to 9.30 A.M. both motion and sensation had been perfect, for he was seen holding a piece of bread, and also moving a cup of milk with his right hand within a few minutes of that time. The paralysis supervened without the least apparent constitutional effect upon the patient. He was under the observation of the registrar when it occurred, who noticed him using his arm freely, and within five minutes called the attention of the nurse, who was washing the patient at the time, to the fact that the arm was hanging helplessly by the side. Within an hour of the coming-on of the paralysis patient became very much more irritable and restless, calling out constantly, complaining of his head, and hardly keeping the clothes on him for a moment. Face had also become slightly drawn to the right side.

A consultation having been held, Mr. Smith had the patient removed to the operating theatre and placed under the influence of chloroform. He then enlarged the wound with a sharp pair of bone forceps, cut off sufficient bone to make room for the point of an elevator beneath the edge of a depressed portion of bone about two inches long in the greatest diameter. This depressed portion he then, by means of the elevator, brought up to the level of the surrounding skull, letting out at the same time about a drachm and a half of pus and dirty brain-matter. A poultice was ordered to be applied to the wound, and the patient sent to bed.

15th.—No change in condition of arm. Face straight and expression vacant. Has lost all power of articulating words; makes a noise, but cannot form words. Has had no sleep; very restless, constantly calling out and getting out of bed. Is very feeble. Bowels open five times in twelve hours since operation, the motions containing a little blood. Pupils equal, dilated, acting. Temperature 101.1°; pulse 140, very feeble but regular; respiration 36.

16th.—Aspect much improved. Arm still in same state as regards motion, but it gives him some slight pain when pinched. Pupils as yesterday. Bowels open four times in twenty-four hours; motions very loose, but containing no blood. Slept well, and is not nearly so irritable or restless. Pulse 116, regular, but very feeble; temperature 98.8°; respiration 28.

17th.—Aspect and power of articulation much improved, but within the last twenty-four hours the left side of the face has become drawn to the left side, and tongue protruding slightly to the right side. Patient is much less restless. Slept well. Appetite much improved. Bowels open three times in twenty-four hours; motions still very loose.

19th.—Power of articulation much improved. What he says now can be understood fairly well. No improvement in condition of arm. Pupils equal. Bowels opened four times in last twenty-four hours, and still very relaxed. Temperature 98.4°; pulse 114.

21st.—General aspect very much improved. Sensation in arm much better, and he is able to raise the limb for the first time; he cannot move or close the fingers. Bowels open; less relaxed. Temperature 97.5°.

28rd.—Gaining power rapidly in arm; is able to close the fingers so as almost to grasp an index finger. Face remains drawn to the left side as before. Poultrice constantly applied to wound, from which there was free discharge. Bowels open once; not much relaxed. Temperature 98.4°; pulse 110.

25th.—Not nearly so well; has been very sick; speech not so clear; less power of movement in the arm; complains of much pain in the head. Bowels opened yesterday, but not to-day. Free discharge from the wound. Pulse 96, very feeble and slow; temperature 97.5°.

28th.—Still very sick; appetite bad; bowels open; expression very vacant. Temperature 98.4°; pulse 114, very feeble, but regular; arm not improved.

29th.—Bowels open very slightly after two enemata of oil. Cheek still drawn to the left; saliva occasionally running from mouth; tongue protruded slightly to the right. Still very sick. To have four grains of calomel on tip of tongue.

30th.—Bowels open very freely. Sick only once since. General aspect very much improved. Appetite better. Arm about the same. Wound looks well; very free discharge; poulticed constantly, and syringed with Condy's fluid and water.

July 1st.—No more sickness; bowels open freely; more power in arm; slept well; takes his food well. Temperature 98.2°; pulse 90, of very much better volume, and regular.

2nd.—Passed a good night. Temperature 98.4°; pulse 94. The arm is gaining power, but is still much colder than the other; sensation is perfect. Wound looks well; discharging freely; treated as before. Bone can no longer be seen at the bottom. being completely covered in.

7th.—Since last note has been gaining power slowly in the arm, but it is becoming more rigid; the flexors are gaining over the extensors of the forearm, and the hand is constantly closed, the fingers being extended by patient only with the greatest difficulty. The right arm is 6° Fahr. colder than the left. The left pupil was noticed to be slightly more dilated than the right for the first time to-day; both act readily to light; face is still drawn to the left as before. Temperature 98.2°; pulse 104, quite regular and of good volume.

14th.—Less rigidity and more power in the right arm; fingers easily extended; noticed to be slightly deaf in the left ear; arms have the same relative temperature as before; very little discharge from wound. Water-dressing applied. Temperature 98.4°. Sleeps and eats well.

20th.—Wound all but healed; patient allowed up; deafness on left side slightly increased; face still drawn to the left side as before; tongue protruded straight. Slowly gaining power in the right arm.

27th.—Wound completely healed. Allowed in the hospital square daily. Has no pain in his head; sleeps and eats well; arm is gaining strength; fingers readily extended. Right arm wasted, being much smaller than the left, and there is still a difference of 6° F. in temperature against the right

arm. Speech quite clear; deafness about the same; and the face is still drawn to the left side.

Aug. 12th.—Patient discharged to-day, with the wound in the head completely and soundly healed. Face still drawn to the left side; tongue protruded straight. Left pupil slightly more dilated than the right; both pupils acting freely and readily to the light. Still deaf in left ear, and this deafness is slightly increasing. The left arm is larger than the right, and is warmer by 5.6° F. There is very good use and movement in the right arm and hand, he is able to button his coat with it, and the strength in it is still improving. Speech has perfectly returned, and he swears with great volubility. He seems rather stupid for his age, and his mother does not think him so bright as before the accident. He has had during the last fortnight three most violent, almost maniacal, outbursts of temper.

LARGE HYDATID TUMOUR OF LIVER AND RIGHT PLEURA; PUNCTURE, FOLLOWED BY COLLAPSE, PERITONITIS, AND SUPPURATION WITHIN THE MOTHER CYST; FREE OPENING, PERMITTING DISCHARGE OF NUMEROUS HYDATID CYSTS FROM TIME TO TIME; PLEURO-PNEUMONIA OF RIGHT SIDE; DEATH; AUTOPT.

(Under the care of Dr. ANDREW.)

For the following notes we are indebted to Vincent Harris, M.B. Lond., house-physician.

Ellen M.—, aged thirty-nine years, an itinerant fruit-vendor, was admitted into Mary ward on Sept. 8rd, 1875. She stated that she had always been healthy and strong up to her last confinement five years ago, since which time occasional pains in the right side had somewhat troubled her, but she had been able to do her work fairly. About twelve months before admission she had noticed that there was a swelling rather high up on the right side of her abdomen, and that it had gradually increased. During the past four or five months the pains in the side had become more severe, sometimes enforcing entire cessation from work. Had never been jaundiced.

On admission, the patient was healthy-looking and fairly nourished; complexion sunburnt; conjunctivæ and skin not jaundiced; functions natural; pulse 80. No abnormal pulmonary or cardiac signs. The lower part of the right side of the chest and upper part of the corresponding side of the abdomen were decidedly bulged. The swelling was rather tender on palpation, and presented in its lower part well-marked fluctuation. The liver dullness began about an inch below the right nipple, extending downwards, in the nipple line, to near the level of the umbilicus,—across, on a slightly higher level, to the left hypochondrium and to the right, and backwards to a proportional extent. The surface, as far as could be made out, was smooth, but presented one or two slight irregularities. The urine was light-colored and acid, of specific gravity 1008, and contained no albumen. The catamenia had been absent for several months. Family history of consumption, but none of tumour.

An hydatid tumour of the liver having been diagnosed, it was decided that it should be tapped after the patient had been put in as good a state of health as possible by rest in bed. Accordingly on Sept. 11th a puncture was made, and about an

ounce of fluid was with difficulty withdrawn with an aspirator. The fluid was glairy and gelatinous, containing, as far as could be discovered, no hooklets or striated membrane.

On Sept. 18th the note is—"Since the operation the patient has been greatly collapsed, and her nails, nose, and lips are singularly blue. Complaints of some pain in her right side at the seat of the puncture, and some tenderness also. The tongue is rather furred on the dorsum. Pulse 108; temperature 99.2°."

For the next few days the patient showed signs of severe peritonitis. Her pulse and temperature rose, her tongue became brown and dry, and the abdomen grew very tender. She lay constantly on her back, with her knees drawn up. Her bowels were very constipated.

On the 16th and 18th she had severe rigors, which were followed on the latter occasion by jaundice, and from the marked evening rise in the temperature, with other symptoms of hectic which followed, suppuration in the hydatid cyst was feared. The jaundice increased for a few days, the urine becoming very dark, of sp. gr. 1022, acid, and containing bile, but no albumen. The pain in the tumour increasing, and the hectic continuing, a large trocar and canula were used on the 23rd to puncture the sac. The fluid which exuded being too gelatinous to pass through the attached tube, the instrument was withdrawn, and dressing forceps were inserted into a free opening previously made. By this means about two or three ounces of glairy, and more or less purulent, fluid were evacuated, and a thick-walled hydatid cyst was removed.

After the operation, as soon as the collapse (which was abnormally severe) had subsided, the patient did fairly well for some time. On Sept. 29th there was a large discharge from the wound (still kept freely open), consisting of a great number of hydatids of all sizes, some whole, but most of them collapsed, of gelatinous fluid and pus. During the next fortnight cysts came away on about eight or nine occasions, and the external swelling decreased in size. On Oct. 8th the patient complained much of cough, and by physical examination the base of the right lung was found to be dull on percussion, with crepitation and rough breathing above the area of dullness. The sputum was pneumonic.

From this time the lung symptoms increased in severity, the patient became more and more cyanotic, and died on Oct. 19th, having been light-headed during the two preceding nights.

There were several discharges of hydatid cysts during the ten days before death. In all it is calculated that fully a hundred cysts were discharged through the opening in the side. The temperature during the whole course of the disease, after the first tapping, was always above normal; it varied from 100° to 108° F., being invariably raised in the evening. The pulse corresponded closely with the temperature. Jaundice appeared on Sept. 19th, as mentioned above, and continued throughout the remainder of the case.

The treatment consisted in perfect rest, light food easy of digestion, and, in the way of drugs, opium to allay pain, to keep the bowels quiet, and to procure sleep, an occasional castor-oil injection being used to relieve the bowels.

*Autopsy.*—On opening the chest and abdomen the liver was seen to be pushed over to the left

side, while in the place of the greater part of its right lobe there was a huge, thick-walled sac, containing fluid. This sac communicated with an hydatid cyst in the right pleural cavity at its back and upper part. The communication was a small hole in diaphragm. Thus, from the second rib to below the umbilicus (as the cyst extended downwards to this point) there was a huge sac containing hydatid cysts, with about four quarts of fluid. The hydatid of the pleura had penetrated for a short distance at one point into the substance of the lung. The lung was collapsed except near the part penetrated, where it was solidified, with a granular appearance on section. The left lung was normal. The heart was not diseased or displaced. The left lobe of the liver was about the size of an ordinary right lobe; the right was about three or four inches broad transversely, and then seemed to spread out as a thin layer of liver substance, soon altogether disappearing on the anterior surface of the hydatid. Gall bladder normal. The liver substance was pale, with rounded edge and amyloid reaction. The spleen was slightly enlarged and amyloid. The peritoneum about the cyst was thickened at the seat of old adhesions, and there was also recent lymph about it. The surface of the left kidney was smooth, with one scar like that of an old infarct; otherwise normal. The right was adherent to under surface of cyst of liver, granular and tough. Cortical substance diminished. Several small cysts on surface. Intestines and mesenteric glands natural.

## UNIVERSITY COLLEGE HOSPITAL.

### TWO CASES OF COMPOUND FRACTURE OF THE LOWER END OF THE HUMERUS.

(Under the care of Mr. CHRISTOPHER HEATH.)

THE following cases of serious injury to the elbow-joint are favorable for comparison, since the accidents occurred within a few hours of each other, and the patients lay side by side under precisely similar circumstances, and were treated in the same way, but with very different results. The first case appeared to be the more serious at first, both on account of the extent of injury and the age of the patient, yet he recovered without having any bad symptoms after the first few days. The second case ended in excision, from which the patient recovered. It is difficult to suppose that any better result could have followed the use of "antiseptic treatment" in the first case than occurred under the old-fashioned plan of applying a piece of lint dipped in blood; and the disorganization of the joint in the second case seems to have been set up by a loose fragment of bone which no external treatment could have reached. The question of primary excision must necessarily arise in cases of injury to the elbow-joint, and where the amount of damage is great there can be little doubt of its advisability; but where the injury is confined, as in this case, to a single bone, with no positive proof of the joint being involved, most surgeons would agree in waiting for more precise indications before submitting the patient to a serious operation.

For the following notes we are indebted to Mr. A. P. Gould.

On June 22nd, W. M.—, aged fifty-two, was knocked down by a cab, the wheels of which passed over his right elbow. He was at once taken to the hospital. On examination, he was found to have a transverse fracture of the shaft of the humerus close to the lower end, and the lower fragment was evidently split, as the inner condyle could be moved apart from the outer, and this produced crepitus. There was a wound, about a quarter of an inch long, just above the inner condyle, leading down to the fracture, evidently produced by the projecting lower end of the shaft; from this there was a free escape of blood. The patient was at once admitted, and the arm was put upon an angular splint; a piece of lint dipped in the blood was applied over the wound, and an ice-bag was applied.

26th.—There is considerable swelling all round the elbow, with a good deal of tension; skin is marked with a slight red flush; not much pain in the part. From this date the redness, swelling, tension, and pain gradually decreased.

28th.—Swelling much less; no pain; suffers from constipation and flatulence, which are treated by the usual means.

30th.—Bowels have been freely open; there is a good deal of bruising all over the back of the elbow; he complains of a little rasping pain in the joint.

July 4th.—Splint changed to-day; a similar one put on. No redness or tension; very little swelling; the wound is now a superficial sore.

17th.—There is swelling and pain in the position of the left external iliac vein, and cedema of the leg and foot. Ordered to have the leg and foot slightly raised, and to take a saline mixture.

20th.—No pain in the groin; swelling and cedema much less.

24th.—Patient left the hospital to-day. It is noted that the wound has quite healed, that the bones have united, but no passive movement has been applied. He is to attend as an out-patient for this purpose. There is still slight cedema of left leg; no pain or swelling in the groin.

On June 23rd, J. A.—, aged twenty-two, ostler, was riding on a horse, when he fell heavily on his right elbow. Finding he was severely injured, he came to the hospital, and was admitted at once. The humerus was found to be broken across at the lower end transversely, and the internal condyle was broken off. The forearm and lower fragment were displaced forwards. Over the lower end of the upper fragment was a wound an inch and a half long, through which the bone could be seen. The displacement was easily reduced by extension and manipulation. The patient appeared to be a fairly strong man, but of unsteady habits. The arm was placed on an angular splint, dry lint placed over the wound, and ice-bags applied.

24th.—Temperature 100° 2'; pulse 88. Slept well; much less pain.

25th.—Temperature 100° 6'; pulse 100. There is a good deal of swelling about the parts, and there is more pain in the joint.

29th.—There is considerable swelling and tension about the joint. On the surface are two or three blebs, which have become purulent. Temperature 100°; pulse 88.

July 2nd.—There is great tension, redness, and pain up along the back of the arm; pus can be squeezed out of the wound from as far as four

inches above the joint. Temperature 100° 2' pulse 96.

4th.—An incision about an inch long was made vertically up from the wound. About an ounce of pus came away. Dressed with an oakum poultice.

5th.—No bagging of pus, which is escaping freely; less redness.

16th.—Since the 5th inst. the temperature has ranged from 100° to 101°; the patient has evidently been losing ground. To-day it is noted that he is pale, perspires much at night, his pulse is weak, tongue slightly furred, and appetite poor. There is very considerable swelling round the joint, both above and below; suppuration is free, and pus flows from the wound when pressure is made over the outer condyle. He was ordered sulphate of quinine and sulphuric acid, fish, and four ounces of wine.

20th.—Temperature 101°; pulse 106. The granulations at the wound form a fungus, which protrudes an inch above the surface. There is more discharge, and the swelling round the elbow has considerably increased the last two days. Fluctuation is distinct over the front and outer side of the joint.

21st.—This afternoon the patient was placed under the influence of nitrous oxide gas and ether, and, in Mr. Heath's absence, Mr. Erichsen proceeded to excise the elbow-joint by a longitudinal incision, about nine inches long, over the back of the limb. The humerus was first sawn off an inch and a half above the line of fracture, which was an inch above the condyles; but as the anterior part of the bone was bared of periosteum a little higher up, the healthy periosteum was stripped up and another three-quarters of an inch of bone removed. The broken ends of the bone were surrounded by pus, and pus was burrowing up the limb, and had extended all round the elbow-joint as well as inside. The articular cartilages were eroded. The ends of the radius and ulna were then removed in the usual way. The limb was put on an angular splint, and the edges of the wound brought together above and below, a drainage-tube being inserted in the middle. An oakum pad was applied over all. Extending down from the transverse fracture in the humerus was a vertical fissure running into the joint, and separating the two condyles; in addition a small fragment of bone was found lying loose in the cavity bathed in pus.

22nd.—Has passed a good night. Perspires much. Temperature 103°; pulse 124.

23rd.—Temperature 102° 4'; pulse 120. The arm is more swollen; there is diffused redness all round the joint. There is some serous discharge from the drainage-tube. He sleeps better; sweats less; appetite good. Wound dressed with carbolic lotion. In the afternoon the sutures were removed, a fresh drainage-tube put in, and the part was irrigated.

24th.—Limb less swollen; redness decidedly less. Temperature 100° 2'; pulse 112. Evidently improved.

30th.—The parts have healed except at two points, the original wound and where the drainage-tube is inserted.

August 1st.—Irrigation stopped. Dressed with red wash.

9th.—The general condition of the patient has wonderfully improved; the swelling of the arm

has much subsided; there is almost no tenderness and no redness. The forearm is being gradually drawn up nearer to the arm.

17th.—Union is much firmer. Passive motion to be begun. Temperature 98.4°.

31st.—Swelling about joint much less. The muscles of the limb are wasted, especially the deltoid, and this allows the head of the humerus to drop slightly. The length of the arm cannot be accurately determined. There is very free motion between the arm and forearm, the bones of which appear to be about two inches apart. Patient has no power of movement at the elbow; he can move his wrist slightly, and also the thumb and two outer fingers; there is no movement in the ring and little fingers. Sensation is perfect except in little finger and inner side of next digit, where it is imperfect.

Sept. 2nd.—There is considerable swelling, induration, pain, and tenderness about the inner part of the arm. A poultice was ordered.

3rd.—As no relief has been afforded, Mr. Heath enlarged the upper of the two sinuses, and evacuated a quantity of pus, which greatly relieved the patient.

18th.—There are two very small, superficial, granulating, healing wounds over the back of the elbow. There is very free movement in the joint, but no voluntary power. He can now feel almost perfectly in the inner two digits, and can move them a little. The power of movement in the thumb is very free. If the fore and middle fingers are held he cannot move the two others at all. Discharged from the hospital to-day to Eastbourne.

The patient returned from the seaside at the end of a month with the incision of the operation perfectly healed, but with the sinus on the inner side still open. The motion in the elbow is very free; but the patient has as yet but little power in the limb, which is still somewhat swollen.

### MIDDLESEX HOSPITAL.

CHRONIC ULCERS OF BOTH LEGS; DRY GANGRENE OF BOTH LEGS—GRADUAL IN RIGHT, SUDDEN IN LEFT.

(Under the care of Mr. HULKE.)

An extremely interesting case of dry gangrene of both legs is at the present time in this hospital. Such a condition as that described below is, we believe, rare, if not altogether unique, in surgical practice. The explanation offered of the mechanism of the gangrene by Mr. Hulke is not only ingenious, but the only one that would account for all the facts. We shall report later on the subsequent progress of this remarkable case. For the notes of its history and progress we are indebted to Mr. G. Sherman Bigg.

The patient, an illuminator, aged thirty-three, had been in the hospital during several of the summer and early autumn months, with chronic ulcers of very old date in both legs. He was discharged on Oct. 12th, greatly benefited by the rest and the care bestowed on him, but with the ulcers incompletely cicatrised. It indeed seemed scarcely probable that they would ever completely and soundly close. After this he stayed at home a

fortnight, and then went to his work—illuminating—for two days. On the third morning he noticed that the lower (the unhealed) part of the ulcer in the right leg, just above the inner ankle, was slightly discolored. It was bluish, then greenish, and next day black. This discoloration shortly extended from the ulcer to the instep, and soon the third and fourth toes became blue, and later black and shrivelled. In this state he applied on the 28th of November to be readmitted. The two toes, a patch of skin on the instep half the size of the palm of the hand, and the lower half of the ulcer in the right leg were in a condition of dry gangrene. He was placed in Handel ward, and the foot and leg were wrapped in dry cotton-wool, and, as he complained of much pain, he was ordered opium in doses of one grain at intervals, regulated by his suffering. Next day it was ascertained that in the night his left leg had become very painful, and the left foot in the morning was found cold and numb; it was also dull white and shrunk, and the cutaneous veins, instead of preventing their usual prominence, were indicated by faint, scarcely marked lines, like little channels. It was now discovered that all arterial pulsation was absent below the groins, nor could any be felt in the left external iliac artery. Mr. Hulke was very doubtful whether there was not a feeble pulse in the right external iliac, the uncertainty on this point being caused by the suspicion that the extremely faint pulse which Mr. Hulke thought he detected here might actually be in the deep epigastric artery, and this suspicion was heightened by the very conspicuous collateral distension of the communicating veins of the internal mammary and epigastric systems. This latter feature disappeared after about twenty-four hours.

In the course of some clinical remarks on the 7th Dec., Mr. Hulke observed:—This is a case of gangrene beginning and slowly progressive in the right leg, and suddenly supervening in the left leg. The gangrene was dry, and dependent on arterial obstruction. The disease began in the right leg, and the hard cylindroid form of its superficial femoral artery, so far as it was accessible to touch, showed the obstruction to be due to clotting. What, then, was the origin of this? Clots, Mr. Hulke said, originate either at the place where they are found, or they have their origin in a plug or embolus, often a morsel of fibrine, brought by the blood-stream from some distant point. Was the clot in the right leg, so to speak, autochthonous or embolic in its inception? Turning to the heart, there was not any evidence of the existence of valvular disease, so that it was highly improbable that a plug should be derived from this source. Next, by listening to the abdominal aorta, this vessel could be heard to pulsate unusually forcibly for a certain distance short of its bifurcation; at this point the pulsation became very faint, and was now quite inaudible. Dr. Greenhow co-operated in ascertaining these data. The fulness of the patient's belly did not allow of an absolute decision, but the conviction was very strong that the inaudibility of the pulsation here was not due to the presence of any tumour or other extraneous mass overlying the vessel, but to its actual cessation. The origin of the clotting had, then, to be sought in the limb itself. The two chief factors on which the fluidity of the blood depends are, they were aware, the constant motion imparted to it by the heart, and the healthiness—in particular the smooth-

ness—of the vessels through which it circulates. The most common disorder which roughens the inner surface of the arterial tubes is chronic deformative endarteritis, a process exactly corresponding in the textural alterations it induces to endocarditis. Chronic endarteritis is, however, usually a widely diffused disorder, and as the arteries of the upper extremities and those of the head bore no traces of its presence, both Dr. Greenhow and Mr. Hulke felt compelled to exclude it from consideration. This narrowed down the field of inquiry to the part where the gangrene first showed itself—the lower end of the chronic ulcer. This first, it will be remembered, became bluish-green, then black—in short, gangrenous. He thought it most likely that some of the smallest vessels, bordering on the ulcer, first were obstructed, whether from textural changes induced in them by the proximity of the ulcerative process, or whether some of them gave way and the occluding clot which sealed them passed inwards along their lumen, is of little moment. Once begun, the clot extended peripherally, blocking the arterial twigs supply the skin of the instep, and later those distributed to the toes, killing those parts and it extended also centripetally, rising through the tibial arteries, through the superficial and common femoral arteries, the external and common iliac arteries, till it projected into the lowest part of the abdominal aorta; there its tapering apex, encountering the downward rush of blood in the main trunk, was swept off by it, plugging suddenly the left iliac or one of its main divisions, when, the obstruction being complete on both sides, the clot grew upwards for a certain height into the aorta itself.

What, Mr. Hulke asked, is the probable forecast in such a case? Though very grave, the man's condition was not hopeless. The gangrene was still slowly spreading, but he judged that it would not ascend above the knees. By using dry dressings desiccation of the mortified parts would be arrested, and by that means the fetor would be kept down and the amount of infective putrid diffusible substances in the limb lessened, and with this the risks of a fatal septicæmia would be diminished. Oakum and charcoal were very useful for this.

In discussing the question of amputation, Mr. Hulke remarked that to do so now, before the eventual limits of the gangrene were known, would be to court gangrene of the stump, necessitating, if the man rallied from the double operation, a second amputation nearer the trunk. Even should a line of demarcation form, the safer plan would be to simply cut through the dead parts, and leave an inch or so of them to be spontaneously thrown off. Such stumps would of course be conical, but later the soft parts could be pushed back and a piece of bone removed if necessary. A not very small experience of gangrene from frost-bite gathered in the Crimean campaign, and the unfortunate results of amputation in dry gangrene of limbs in typhoid fever, had taught him that a cautious expectant treatment was safer for the patient than early operative measures in gangrene dependent on arterial obstruction.

Dec. 7th.—His temperature, which since his admittance has varied between 98°8' to 99°6', has risen to 100°2'. His pulse averages about the same—116. His feet are both becoming darker, although the pulsation is rather stronger, especially

on the right side, than previously. He still requires six opium pills a day (one grain each) to keep him free from pain.

9th.—Complains of sore throat, which is somewhat relaxed. Ordered chlorate of potash gargle. The line of demarcation on the right foot is beginning to show itself above.

11th.—The left foot is losing its dark color and assuming one of a more pinkish hue; the right foot is also improving, but the line of separation above is more marked. His temperature is 101°4'.

18th.—The line of separation daily becomes more conspicuous on the right leg. The two toes, which were black, are still quite firm, and do not show any signs of separating. The left foot is beginning to assume a more natural color. The pulsation in the right groin is very much stronger, but does not extend below the groin; on the left side the pulsation is not so marked, but is stronger than when the patient was admitted; it also cannot be felt below the groin. Sore throat is now quite relieved. Last night and this morning his temperature has been for the first time normal. Patient states that he feels better and much improved in general health. The thighs are warm.

#### KING'S COLLEGE HOSPITAL.

A CASE OF INTUSSUSCEPTION OF THE LARGE INTESTINE; ABDOMINAL SECTION; DEATH.

(Under the care of Mr. ROYES BELL.)

THE following case is important as illustrating the difficulty that may attend the reduction of an intussusception, even when there are no adhesions.

The patient was originally under the care of Dr. J. Henry Philpot, physician to the St. Pancras and Northern Dispensary, to whom we are indebted for the subjoined notes.

A male child, sixteen months old, was taken by his grandmother to the dispensary on October 21st. The grandmother stated that the child had been delicate from birth, and had been brought up by hand; and that he had been troubled for a long time with diarrhoea. On Oct. 17th the diarrhoea suddenly ceased, but as the child seemed as well as usual, except that he showed less desire for food, no attention was paid to it. When in bed with him on the night of the 18th she was disturbed by his suddenly crying out with pain, and noticed that he had wetted his night-dress. By the morning light she found his night-dress stained with blood, and there was also a clot of dark blood on it of the size of a half-crown. From that time the child became manifestly worse: he was dull and sleepy; refused nearly all food, and mostly brought up the little that he had been coaxed to take. At the same time there was great thirst. The child showed signs of suffering from pain, and his belly swelled. Every now and then he appeared to strain, but the only result was a small quantity of slime and blood.

When first seen (October 21st) the child looked pale and anxious; his limbs were thin and flabby, but the abdomen was swollen and tympanitic. On deep pressure in the left iliac region, a distinct tumour could be felt extending up into the left lumbar region. Its limits could be clearly mapped out by percussion, and it was found to be about

three inches in length, and one inch in breadth. About the anus some blood-stained viscid mucus was found clinging. On digital examination per rectum, no obstruction could be detected, but on gently passing a soft bougie, some resistance was met with about five inches above the anus. The child bore all these manipulations without complaint. Intussusception of the larger bowel was diagnosed. On the following day the child was seen by Mr. Cross, the resident surgeon, who stated that, on rectal examination by the finger, the anus was found to be very lax and the rectum roomy; about three inches from the anus, the finger met with an obstruction, which was evidently an intussuscepted portion of the bowel, which was felt projecting into the rectum in the form of a soft, rounded tumour, resembling the os uteri in the pregnant state. The finger could not only be passed round the descended gut, between it and the rectum, but was also easily admitted into the orifice of the former. On withdrawing the finger, it was found smeared with blood and mucus, showing that the intussuscepted mass bled easily. On examination with the rectal speculum, the invaginated portion presented an ash-grey color. The resisting tumour was still to be felt in the left iliac fossa, and its boundaries could be distinguished on percussion as before. Copious injections of warm soap-and-water were made by Mr. Cross, but without the desired effect of restoring the intussuscepted bowel.

As it was impossible to proceed to more radical treatment at the grandmother's house, the child was admitted into King's College Hospital, under the care of Mr. Royes Bell, who is also surgeon to the dispensary.

On Saturday, the 23rd, six days after the cessation of the diarrhoea, the symptoms were in all essential points unchanged, except that the child was more apathetic, the abdomen was more swollen and tympanitic, and there was still less appetite. Vomiting continued, but was by no means frequent or distressing, and the ejecta were inoffensive. It was determined on consultation first to inject air per rectum, and in the event of that expedient proving unsuccessful, to proceed at once to perform abdominal section. A few whiffs of chloroform were given, and a tube was passed up to the orifice of the intussuscepted portion, gentle attempts being made to return the bowel by this means. These attempts were, however, unsuccessful, as was also the injection of air into the lower bowel and into the orifice of the prolapsed bowel.

Abdominal section was then performed. An incision through the skin was made down the median line of the abdomen, commencing one inch above the umbilicus, and extending nearly to the symphysis pubis, and the layers of abdominal wall were divided upon a director. The peritoneum was carefully opened, and the intestines were seen to be much distended with gas, and pink and injected on their surface. It was impossible to prevent some portion of the small intestines from escaping from the wound, but they were immediately covered by a cloth wrung out in warm water. The intussuscepted bowel was readily found, occupying the left iliac and lumbar regions. It was from three to four inches in length, about one inch in diameter, and sausage-shaped, solid to the touch, and dark purple in color, with distended vessels ramifying upon its surface. It was evident that a portion of the descending colon had become

intussuscepted in the sigmoid flexure. Attempts were made to reduce it, but though as much traction was made as could be safely ventured upon, it could not be moved. Mr. Bell therefore proceeded to pass threads through the portion of bowel immediately above the intussusception, and then opened it. A quantity of grey fecal fluid and some gas escaped from the opening, and the former was received upon sponges, none of it being allowed to come into contact with the peritoneum. The escaped bowels were then returned with some difficulty, and the opening in the abdominal wall was closed, the artificial opening in the bowel being sutured to the upper part of the external wound. The child seemed to bear the operation well, but his strength gradually failed, and he died about seven hours after it.

On examination of the body forty hours after death, the thoracic viscera were found quite normal. In the abdominal cavity the intestines were glued together by recently formed lymph. The intussuscepted portion was discovered occupying the left region of the abdomen. A part of the transverse colon, the splenic flexure, and part of the descending colon were intussuscepted by the rest of the descending colon and the sigmoid flexure, whose serous coat was ruptured in several places. It was found impossible to reduce the invaginated bowel by using ordinary force. On opening up the sigmoid flexure the intussuscepted portion was seen to be twisted in a somewhat spiral manner. On cutting through the second layer of sigmoid flexure no lymph was found between the serous surfaces, except at the extreme lowest portion of the bend. The portion of bowel projecting into the rectum was found deeply congested and moderately hard. The orifice in its centre was elongated, owing to the traction of the mesentery in that portion of the lip of the orifice corresponding to its attachment. A large-sized catheter could be passed right through the intussuscepted portion into the normal intestine above it. The stomach and the rest of the intestines were moderately distended with gas; the other abdominal organs were perfectly natural.

It may be remarked, that from the first there could be no doubt about the diagnosis, but, in any case, the prognosis was almost hopeless, especially after the failure of the milder methods of treatment. It was one of those cases in which Mr. Hutchinson recommends early resort to the operation of abdominal section; but though, as proved at the post-mortem, the adjacent serous coverings of the bowels were not bound together by lymph to any great extent, it was found impossible to reduce the intussusception by traction, either in the operating theatre or in the dead-house. The history of the case—intussusception following on constant diarrhoea—points to another risk attending the latter condition in young children, and provides an additional argument in favor of arresting it as soon as possible.

#### MOORFIELDS OPHTHALMIC HOSPITAL.

(Cases under the care of Mr. HUTCHINSON.)

SYPHILITIC KERATITIS AT AN UNUSUALLY EARLY AGE.

AMONGST the patients at Moorfields on Monday morning, December 18th, 1875, was a child aged



three, who was suffering from well-marked and symmetrical interstitial keratitis of about a month's (?) duration. The child looked healthy, and had a good set of milk teeth, but there was the history that it had been treated at St. Bartholomew's Hospital in infancy for a long-continued rash and severe snuffles, and that it was then not expected to live. Mr. Hutchinson remarked that the interest of the case was in the unusually early age at which the keratitis occurred. There could, he said, be no doubt, from its character, that it was due to inherited syphilis, but he did not recollect ever to have identified this form of eye disease in so young a patient; he had several times seen it at five years old, but as a rule it did not occur till from eight to ten, and was yet more frequent about the time of puberty; it might even be delayed to the age of thirty or thirty-five, and then develop in a most characteristic manner. He was not prepared at present to give any explanation of this wide difference of range.

#### SUPPURATION OF THE LACHRYMAL SACS IN INFANTS.

A child of three years old was brought on account of discharge of matter from the eyes. The mother stated that her doctor discovered within a few days of the child's birth that matter came from the corners of its eyes, and that this had persisted ever since. There had never been any inflammation of any part. On pressure over the lachrymal sac pus regurgitated freely through the canaliculi. Mr. Hutchinson remarked that he had seen but one similar case; in that instance he was consulted by a surgeon in the case of his own child, an infant of a few days old, which had supuration of both lachrymal sacs. There was no redness or evidence of inflammation. Pressure over the sac caused a free escape of puro-mucus. On account of the delicacy of the parts it was thought better, for a time at least, to abstain from mechanical treatment; and in the course of a few weeks, under the use of an astringent lotion, it entirely ceased. It was very difficult to form any conjecture as to the cause of the symptom in these two cases. Both the children were quite healthy; in both it occurred so immediately after birth that it was difficult to suspect any exposure to cold, and in both it occurred on each side, making the action of any accidental cause improbable.

#### OPHTHALMIC CASES.

(Under the care of Mr. HUTCHINSON.)

*Saemisch's Operation for Hypopyon Ulcer.*—Several cases have lately come under notice in which Saemisch's proposal of cutting across the centre of the cornea in cases of serpiginous ulcer with hypopyon has been carried out, and in most the success has been exceedingly good; in some, however, the treatment has proved troublesome, and it has been necessary to keep the wound open by the repeated use of the spatula for long periods. Before the publication of Saemisch's paper, Mr. Hutchinson was, he stated, in the habit of doing an iridectomy downwards, and he was by no means sure that he did not still prefer that method. The two plans had the same object in view—to diminish the tension on the inflamed cornea, and at the same time to evacuate the hypopyon. In many cases after an iridectomy the patient's pain is at once and permanently relieved; the hypopyon

never re-forms, and the ulcer steadily heals afterwards. As there is generally a central opacity resulting from the ulcer, the iridectomy method of treatment has the additional advantage of securing beforehand an artificial pupil. Mr. Hutchinson referred to Mr. Teale's able report on Saemisch's operation in a recent number of the *Ophthalmic Reports*, and quoted Mr. Teale's eulogy to the effect that it was a proposal second only in practical value to Graefe's operation for glaucoma. He was almost prepared to endorse this estimate if it were allowed to include iridectomy also. He wished, however, to insist strongly that neither of the two rival operations ought to be resorted to until after an efficient trial of the hot-fomentation plan. In a large majority of cases, corneal ulcers with hypopyon, if seen in an early stage, will do perfectly well if the patient be put to bed and the eye fomented constantly with a hot belladonna solution; but it must be almost literally constant, and as hot as the patient can possibly bear it. Anything short of this in these dangerous cases is usually only waste of time.

*Treatment of Onyx with Hypopyon.*—Onyx with hypopyon is a much less common condition than the serpiginous ulcer. By chance two interesting examples of it are at present attending. In each the onyx was central, and in neither at the time the treatment was begun was there any ulceration of the surface. In each of them the treatment ultimately adopted was an incision through the centre of the onyx into the anterior chamber. In the first the hypopyon repeatedly relapsed, and the onyx re-formed as soon as the edges of the corneal incision adhered. It was necessary to use the spatula every morning for nearly three weeks. A fairly satisfactory cure was at length obtained. The second case is still under treatment. Mr. Hutchinson stated, in respect to these cases, that they were the only ones in which he had employed the incision for onyx, and that in neither of them had the result been so definitely good as to tempt him in the future to forego a patient trial of the fomentation plan before resorting to operation.

*Retinitis Hæmorrhagica as a consequence of Gout.*—An interesting case in confirmation of the opinion that retinal hæmorrhages are particularly prone to occur in the subjects of gout came under notice the other day. The patient, an elderly man, came on account of cataract in one eye, but, in taking his history, it was discovered that he had suffered severely from gout. Ophthalmoscopic examination of the non-cataractous eye, which he considered to be quite sound, revealed the presence of two flame-shaped patches of extravasated blood near to a large retinal vein and artery. Mr. Hutchinson remarked that he had long held that the cases of typical retinitis hæmorrhagica occurred almost solely in the subjects of gout. This case was not one which could be definitely placed in that category, since the hæmorrhages were not numerous, and there was little or no evidence of inflammation of the retina. Still, however, their presence was of interest in reference to the opinion that there was a special tendency to retinal hæmorrhage in gouty patients.



## ST. THOMAS'S HOSPITAL.

ANEURISMAL VARIX OF LEFT COMMON ILLAC VEIN;  
COMPRESSION OF AORTA; GANGRENE OF  
INTESTINE.

(Under the care of Mr. SIMON.)

THOMAS K—, aged thirty-eight, a driver in the Royal Engineers, was admitted into Albert ward on Feb. 16th, suffering from aneurism within the abdomen. On the 3rd of March, after the patient's bowels had been thoroughly cleared out by castor oil, compression of the abdominal aorta by tourniquet was commenced at 10 A.M., preceded by the subcutaneous injection of half a grain of morphia at 9.30, which was repeated at 10 A.M. Mr. Simon not being satisfied with the instrument, which failed to control completely the pulsation without digital assistance, it was discontinued at 11 A.M., but recommenced at 11.30, the same instrument being supplemented by a cord attached to the side of the bed, another injection of morphia being given at 11.30 A.M. After the application of the tourniquet the heart-murmur became more marked, and the pulse increased in frequency, probably partially due to excitement; profuse perspiration of body and flushing of face, the legs presenting a blue, mottled appearance.—12 P.M.: Restless, and complaining of very great pain. Temperature 95°. Subcutaneous injection of half a grain of morphia.—2.30 P.M.: Pain less severe, and patient quiet. Temperature 95.6°. Extremities warm; compression not invariably complete, blood occasionally passing, but stopped by an additional turn of the screw.—5.20 P.M.: Hiccough came on and lasted about a quarter of an hour, during which time pulsation was felt in the aneurism. This pulsation continued until the screw of the tourniquet was brought into a vertical position by means of another cord attached to the bed; pulsation then ceased in the tumour and in both femoral vessels.—6.30 P.M.: Feet cold; left leg feels less tense than before; penis rather turgid.—10.30 P.M.: Compression remains effectual; dozes a good deal; hands rather cold; pulse 104.—11.10 P.M.: Passed five ounces of very offensive, clear, brownish urine, non-albuminous.—11.25 P.M.: Complains of a good deal of pain; screw loosened half a turn without any pulsation becoming perceptible; hands feel warmer. Subcutaneous injection of half a grain of morphia.

March 4th.—1.15 A.M.: Temperature 99°; pulse 103; not complaining of much uneasiness.—3 A.M.: Tourniquet removed; slight pulsation perceptible in tumour and right femoral; both legs warm; patient restless; subcutaneous injection of half a grain of morphia administered; ulcerated surface on left leg looks unhealthy, and greenish in color; an oval, red, and tender patch above umbilicus, corresponding to where pressure of tourniquet was applied, to be relieved by warm fomentations. During the whole time of compression no nourishment was taken, with exception of a teaspoonful of milk occasionally. Measurement of left thigh, 27 inches.—9 A.M.: Sleeping, looks much worn; pulsation in tumour decidedly diminished.

5th.—Was troubled all day yesterday with hiccough, which still continues with increased frequency; patient much depressed and exhausted; was sick at intervals from 11.30 P.M. until 2.30 A.M., bringing up about a pint and a half of black fluid; bowels acted twice. Morning temperature

98.4°; evening temperature 99°; pulse 120; some tenderness of abdomen, but only at point of pressure; ulcer on leg is now black in color; slight pulsation in right femoral.

6th.—Morning temperature 98°; pulse 106; no more vomiting; hiccough still continues; appears to be doing well, but is still much depressed. Took four ounces of brandy and some champagne in the afternoon.

7th.—Morning temperature 98.8°; evening temperature 99.8°; vomited about four pints of black offensive fluid during the night, and again three pints in the afternoon.

8th.—Wife anxious to remove him, which was with great difficulty prevented; patient feels better; no pulsation in aneurism perceptible; hiccough still continues, also vomiting of black offensive fluid. Morning temperature 98°; evening temperature 100.6°.

9th.—Much worse this morning. Morning temperature 100.8°; sickness still continues; is gradually sinking. He died at 12.55 P.M.

*Post-mortem.*—The abdominal walls corresponding to the point of pressure were about double their ordinary thickness, due to inflammatory infiltration. The great omentum was freely adherent to the anterior abdominal wall, but presented no sign of inflammation. The peritoneal cavity contained between three and four ounces of turbid fluid. Intestines distended, especially the upper part of the small intestine; on their external surface there was scarcely any trace of inflammation, but they were glued together, especially towards the flanks, by a very thin layer of inflammatory lymph; but here and there were seen pearly spots varying in size from that of a sixpence to that of a pea, corresponding to the parts where the necrosis had removed the whole thickness of the intestine, with the exception of the serous surface, and would eventually have perforated through into the peritoneum. Mucous membrane of stomach congested and dotted with minute punctiform injections, so also the upper part of the small intestine, the injection becoming more marked as the intestine proceeded onwards, assuming at length a deep purplish-red color. About two feet below the pylorus, on the edge of the valvula conniventes, were minute yellowish flakes resembling croupous exudations, this condition gradually increasing until the greater part of the ileum presented a uniform wash-leather-like slough, the mucous membrane being of an ochrous color, relieved by the velvety red edges of the valvula conniventes. Springing from the point of bifurcation of the abdominal aorta was seen an aneurismal sac about the size of a hen's egg, lined by a thin layer of fibrin. The left common iliac vein, which was greatly dilated, opened directly into the sac, and had no communication with the inferior vena cava. The superior mesenteric artery was completely obliterated for a considerable length, where, together with the mesentery, it was converted into an inseparable brawny mass.

## HOPITAL TEMPORAIRE, PARIS.

## CASE OF DIABETES.

(Under the care of Prof. LECORCHE.)

The following case of diabetes, presenting some

interesting points, occurred in the practice of Prof. Lecorché.

P. R.—, aged twenty-four, an oil purifier, was admitted into the hospital on the 24th Aug., 1875, with diabetes. His mother and sisters are all living and enjoying good health; his father died of rheumatism. Had only been once ill himself, and that with an attack of pneumonia. No history of syphilis or of intemperance.

About a year ago the patient seems to have experienced great moral sufferings, owing to some family affairs and the death of a young person whom he was about to marry. These sufferings seem to have made a most painful impression upon him.

His health began to fail three months before his entrance into the hospital. He had a constant feeling of fatigue and a sensation of weakness in the extremities. He got visibly thinner, but remarked that his appetite had increased and that he was troubled with constant thirst and his tongue was continually dry. Shortly after he began to feel a need of frequently voiding his urine, and was also troubled with some dyspepsia, burning behind the sternum, and vomiting.

On admission the patient was greatly emaciated; weight 114 pounds; complained of sharp pains in the calves, dry burning feeling of the throat and tongue; the latter was of a dark red hue and mottled with white streaks denuded of epithelium in certain spots; appetite good, but has sour eructations after copious meals. Pulse 60, strong and regular; heart-sounds normal, as also the proportion of red globules in his blood. For the last two months he had had no penile erections. His sight became confused when he read for more than five minutes, and he sometimes saw red circles; at other times everything appeared white to him; there was paralysis of accommodation. His temperature during the first part of his stay in the hospital varied from 36° to 36·8° C.

The urine was pale-citron color, slightly acid; and contained 40 grammes of sugar and 4 grammes of urea to the litre. For the first week the average quantity of urine was 8½ litres in the day, and 2½ at night. At this period the patient had a slight attack of bronchitis, which was not followed by any bad consequences. The appetite, which had diminished under the influence of certain gastric disorders, was now again good, the patient eating eight portions a day, and 500 grammes of meat. He drank about 6 litres of liquid a day.

September 25th.—The patient had diarrhoea, and from this date the urine averaged 4 litres a day—sugar 35 grammes, urea 2·5 grammes per litre. He was put under treatment, consisting of opium pills, gluten bread, Vichy, and an azotised diet. He showed some signs of an amelioration in his condition.

28th.—Passed 8 litres of urine. Proportion of red globules diminished.

October 2nd.—Passed 10 litres of urine. Was ordered 4 grammes of jaborandi. Sweated profusely, and expectorated 8·50 grammes of alkaline saliva.

5th, 6th, and 7th.—Passed 10 litres of urine. Profuse sweating. Salivation.

8th.—Patient left the hospital at his own request.

November 7th.—Patient entered the hospital again. He had tried to work again, but was obliged to cease on account of his strength failing. He perceived a swelling situated on the lower part

of the outer side of the leg. This swelling had come on without any traumatism or pain. Little by little the temperature rose, the tumour increased in size, and the skin became distended.

8th.—Fluctuation was easily felt in the tumour. Temperature 37·2° Cent. Average of urine 8 litres in 24 hours; specific gravity 1081; sugar 76 grammes, urea 5·6 grammes per litre; red globules 3,500,000 per cubic millimetre. Evening temperature 38° Cent.

10th.—Abscess opened, gave vent to 300 grammes of laudable pus. Chloral dressing.

11th to 16th.—Average of urine was 9·3 litres per diem, and the temperature lowered down to 36·6°. Abscess presenting a favorable appearance.

17th.—Urine 12 litres; sugar 100 grammes, urea 7 grammes per litre.

This increase in the proportion of sugar was due to the weakness consequent on the inflammation.

*Remarks.*—Prof. Lecorché indicated the following points of interest in the case:—1. The etiology of this case would tend to confirm the opinion entertained by MM. Claude Bernard, Seegen, Bouchardat, and Pavy, as to the influence of nervous causes in determining the disease. (Experiments of Claude Bernard on Spinal Cord, 4th vent.) 2. The enormous quantity of sugar, 1200 grammes a day; and the fact of the urea being always in proportion to the quantity of sugar, as stated by MM. Pettenkofer, Vogt, and Lecorché, who admit an augmentation in the quantity of urea in cases of diabetes; polyuria being in proportion with quantity of sugar. 3. The formation of an abscess, which was opened without the supervision of any gangrene, which is stated to be the general result in cases of this kind by certain authors. This complication verified the statement that the temperature rises in diabetes under the influence of an intercurrent inflammation. Under the influence of this inflammation the quantity of sugar was reduced to 300 grammes, which augmented to 1200 grammes as soon as the appetite returned, notwithstanding the treatment he was put under. Prof. Lecorché terminated his remarks by saying that he regarded all treatment in advanced stages of the disease as almost useless, and considered that in these stages the proportion of sugar in the night urine might equal, and even exceed, that of the day.

## WEST LONDON HOSPITAL.

### TWO CASES OF INTERNAL URETHROTOMY FOR NARROW, NON-DILATABLE STRICTURES; GOOD RESULTS.

(Under the care of Mr. TEEVAN.)

THE following cases are interesting as showing the efficiency of the operation, the slight annoyance it occasions, and the brief confinement it necessitates.

CASE 1.—George G—, a healthy-looking sailor, aged thirty, was admitted into the hospital on Nov. 2nd. The patient stated that six years ago he suffered from a gonorrhoea, for which he was treated with medicines and injections. The complaint degenerated into a gleet, which hung about him for a long time. A year ago he had an attack of retention, which he overcame by hot gin-and-water

and severe straining. Three months ago, when at New York, he had another attack, and the surgeon whose advice he sought was not able to pass a catheter till he had anaesthetised him. When he applied to Mr. Teevan six weeks ago he complained of frequent and difficult micturition, and the annoyance of having his "pants" always wet from the dribbling of urine. Examination detected the existence of a tough stricture three-quarters of an inch long, four inches from the meatus externus. There were also three ring strictures of large calibre in the penile urethra. Gradual and continuous dilatation were both fairly tried, but the deep stricture could only be enlarged sufficiently to admit of the passage of a small catheter, and as it was desirable that the patient should be able to introduce a full-sized instrument for himself, he being a sailor, an operation was indicated. Accordingly, on Nov. 2nd, at 8 o'clock P.M., Mr. Teevan passed a catheter staff, and, having proved its position by withdrawing some urine through it, divided the stricture internally from before backwards. Only a few drops of blood were lost; a large metal catheter was introduced, and the water drawn off quite clear, to demonstrate that the calibre of the urethra was re-established, and that there was no hæmorrhage into the bladder. At 10 A.M. the next morning Mr. Noot, the house-surgeon, found the patient had slept well, and that his tongue was clean and moist, and the skin cool. The pulse was 78, and temperature 98.4° F. Micturition was attended with much smarting. On Nov. 5th the patient was up and walking about the ward; the soreness was nearly all gone. No. 20 (Charrière) metal catheter was passed; on the 6th, No. 22 olivary metal bougie; on the 8th, No. 22 conical elastic bougie; and on the 10th, No. 20 silver catheter. The patient left the hospital the same day quite well in all respects. He has since learned to pass a full-sized elastic bougie with ease for himself.

CASE 2.—Robert P., a thin and rather haggard-looking laborer, aged thirty, applied as an out-patient on Oct. 9th. He stated that he had never had gonorrhœa, gleet, or syphilis; but that fifteen years ago he was rolled over and kicked in a scuffle, and that his urine ran away from him. For the last ten years he has passed a very bad stream of urine, and a year ago was attacked with retention, for which he went to St. Thomas's Hospital. No instrument could be introduced, but he was relieved by a hot bath. At the present time the patient is troubled with difficult micturition, accompanied by much straining. Examination detected a very tough thick stricture, half an inch long, three and a half inches from the meatus externus. Gradual dilatation was tried, but no progress was made, and only the smallest elastic catheter could be introduced. On the 2nd of November the patient entered the hospital, and at 3.30 P.M. the same day Mr. Teevan divided the strictures, internally, from before backwards, having first demonstrated that the catheter-staff was in the bladder by withdrawing some urine through it. About a teaspoonful of blood was lost. A large metal catheter was passed, to prove that the calibre of the urethra was restored. The water which flowed through from the instrument was quite clear. At 10 o'clock the next morning Mr. Noot found the patient comfortable; tongue clean; skin cool; pulse 90; temperature 98.4°. On the 5th,

No. 20 metal catheter was passed; on the 6th, No. 22 conical metal bougie; on the 8th, No. 22 conical elastic bougie; and on the 10th, No. 20 silver catheter. The patient left the hospital the same day in all respects quite well. He can now pass a full-sized elastic bougie for himself.

Mr. Teevan observed that he considered no operation upon a passable stricture justifiable unless milder measures had been tried and found wanting. In the cases under notice, dilatation had been employed without success, because the strictures were so tough as to be incapable of being dilated beyond allowing a small catheter to pass. An operation was therefore indicated, and he had selected internal urethrotomy as most appropriate for these particular cases. The great point in the operation was to prove, before cutting, that the catheter-staff or guide had really been passed into the bladder, which he had done by withdrawing urine through it. Provided this, the one thing needful, were done, it mattered but little whether the stricture was divided from before backwards or *vice versa*. Some surgeons had an objection to the division from before backwards, but the objection could not be maintained, and had arisen from the fact that formerly the division from before backwards had been performed without demonstrating that the instrument was really in the urethra. Hence it was that mistakes had arisen from the urethrotome having been passed into a false passage or the rectum, and thus it was that the principle of division from before backwards had been saddled with the errors of a faulty execution, which really formed no part of the operation. In internal urethrotomy the prostate and neck of the bladder were not touched. This was a most important point, for whatever hæmorrhage ensued it must make its exit at the external meatus, as it could not gravitate backwards into the bladder, its neck being firmly closed. If a blood-clot formed in the bladder a stone might result. Now, this could not occur in internal urethrotomy, but it might do so when a stricture was forcibly dilated, for Civiale had pointed out that in that operation the neck of the bladder might be injured, and allow of hæmorrhage into the organ, and he had been informed of a case where, after the operation of immediate dilatation, a stone had formed on a blood-clot. Of all operations for stricture internal urethrotomy was attended with the least risk. Its twin sister—subcutaneous section—excelled it so far as regards the certainty of ensuring a thorough division of a stricture, but it was not always applicable.

## HOPITAL ST. ANTOINE.

CASES OF SYPHILITIC HEADACHE AND NEURALGIA  
CURED BY CALOMEL IN SMALL AND RE-  
PEATED DOSES.

(Under the care of Dr. PETER.)

In syphilitic headache, which is always so painful and often produces obstinate insomnia, as well as in neuralgia of venereal origin, Trousseau used to prescribe calomel in very small and repeated doses; for instance, one centigramme (or about one-sixth of a grain) a day, divided into ten doses,

administered at one hour's interval, so that the patient would take one milligramme only (or about one-sixtieth of a grain) every hour.

Dr. Peter, following Trousseau's example, uses this drug in similar cases as well as in doubtful ones, in which it has the excellent effect of speedily determining the nature of the disease.

Dr. Peter often quotes the instance of a young girl who entered Trousseau's wards for a severe facial neuralgia. For more than fifteen nights the patient had not slept, on account of the intensity of the nocturnal pains. The illustrious "clinician" noticed on the girl's temple the presence of a very small tumour, painful on pressure, and which he thought must be of syphilitic origin. Possibly the tumour rested on some filament of the temporo-facial nerve and produced irritation of it. Anyhow, he resolved to prescribe calomel immediately in doses as above described. The very same night the young woman slept four hours. The next night was attended by perfect sleep, and the pain disappeared entirely on the third day, though the size of the tumour had not much decreased.

Amongst other cases treated in like manner by Dr. Peter, the following are worthy of being noted.

A woman, aged twenty-three, was admitted on October 9th, 1874, for various syphilitic manifestations, large *plata muqueux* of the vulva and anus, a general papulo-squamous syphilitic eruption, &c. For these lesions the patient had already been put under a course of protoiodide of mercury before entering the hospital. But her chief complaint was a most violent nocturnal headache, beginning at 4 P.M. and lasting till 4 A.M., and which completely deprived her of sleep. Moreover, she had fever, and complained of intense pain along the nerves of the left arm and in the brachial plexus of the same side. On October 10th, instead of continuing the use of the protoiodide of mercury, as had been prescribed in town, Dr. Peter ordered one centigramme of calomel in ten doses, each to be given at an hour's interval. The next day (the 11th) the patient's report was that she had suffered less during the night. The headache commenced only at 6 P.M., and left her at 2 A.M., after which time she was able to sleep. The pain in the arm had been the same. In the night of October 11th-12th the headache almost completely disappeared. It commenced very slightly at 7 P.M., and was so slight that the patient was able to sleep almost the whole night. The fever had also ceased. The calomel was then discontinued, nevertheless the night of October 12th-13th was excellent. The headache went off entirely, and the pain in the arm had diminished considerably. From that moment the classic treatment of syphilis—viz., the protoiodide of mercury—was resumed in order to combat the other syphilitic manifestations.

In another woman, who entered Dr. Peter's wards on the 20th of February this year, the syphilitic headache had been going on for nearly a month. It had been general at first, but after a fortnight became confined to the left side of the head. As usual, the pain was much more intense at night than in the day, and prevented sleep. Together with this headache, the patient complained of an intense pain in the right side, and indeed it was for this latter ailment that the patient had sought admittance into the hospital. Dr. Peter stated that it was seated in the situation of

the chondro-costal articulation of the left side, which was slightly tumefied. Moreover, the patient had syphilitic roseola. On Feb. 22nd ten milligrammes of calomel were prescribed, but through some mistake only two were given. The patient suffered much from the head during the night. On the 23rd ten doses were administered. The headache disappeared almost completely, and the patient slept for ten hours. On the 24th, the stitch in the side, which had been already less painful two days before, when only two doses were taken, diminished to such an extent that it required rather strong pressure to produce any pain. On the 25th the ten doses were again forgotten, and the patient did not sleep so well as on the previous night. The sleep was, however, better than at first, and the headache less intense than before the calomel was used. The ten doses were given this day, and the patient slept from 8 P.M. till midnight. From that hour she only got sleep in snatches, but without having any pain in the head; the pain in the side had by this time completely disappeared. On the 27th the general treatment of syphilis with a syrup containing iodide of mercury and iodide of potassium was commenced. The headache was only felt two hours in the nights of the 27th and 28th, and afterwards entirely ceased.

The remarkable features of this mode of treatment, says Dr. Peter, are—first, the rapidity of its action; next, the fact that it is successful in cases where the really specific treatment of syphilis fails. It constitutes, in a manner, the medicine of nocturnal syphilitic pain; but cannot replace the other plan of treatment for other syphilitic manifestations. Its use is indicated whenever nocturnal pain is very intense and interferes with sleep. It diminishes pain and its consequences the very first night it is given, and generally extinguishes suffering by the second night. The treatment may be carried on for three days, and that period of time is almost always enough for its success. If, however, the desired result has not been obtained, it ought then to be suspended for one or two days, so as to prevent salivation; and it can be resumed afterwards for two days successively, in which case Dr. Peter has never seen it fail.

Dr. Peter thinks that this plan of treatment is thus efficacious because—first the drug is mercury; and, secondly, the absorption of these very small doses is exceedingly rapid, and the repetition of the action takes place every hour. Whatever the explanation may be, adds Dr. Peter, it is to Trousseau that he is indebted for the idea of using calomel in this manner, and to him belongs all the credit.

#### ROYAL HANTS COUNTY HOSPITAL.

CASE OF SEVERE NEURALGIA IN THE TRACT OF THE RIGHT DENTAL NERVE; OPERATION; RECOVERY.

(Under the care of Mr. LANGDON.)

For the following notes we are indebted to Mr. William Robert Smith, house-surgeon.

The patient was a nurse, who had for the last three years suffered from intense neuralgic pains in the face, occurring at irregular intervals, but generally caused by eating, drinking, or exposure

to cold. The fits of pain were always preceded by a stinging sensation at the side of the mouth, then a feeling as if a number of hot irons were being thrust into the tongue, followed by the most severe pain, from the symphysis to the ramus of the jaw on the right side, and thence to the temple, spreading both backwards and forwards. During the two years that the patient had been a nurse to the hospital every medicine which was likely to give relief had been tried; but as the pain increased in severity, at the patient's entreaties that something more should be done, it was decided to divide the dental nerve. This was done on Sept. 1st. An incision was made along the anterior margin of the masseter muscle, another at right angles to this along the body of the jaw, and the triangular flap of skin raised; the bone was then trephined with an instrument three-quarters of an inch in diameter, and the dental nerve and artery were thus exposed in their canal. About half an inch of the nerve was then removed. Troublesome hæmorrhage took place from the dental artery, but was arrested by the application of a red-hot wire. The edges of the wound were then accurately brought together by means of silver wire, a small opening being left at the apex of the angular incision for the escape of pus. Carbolic oil (1 in 80) was then applied.—8 P.M.: Feels very comfortable. Has had no return of the pain; been slightly sick once. Pulse 120; temperature 102° 3'.

Sept. 2nd.—Slept fairly. No pain, but occasional headache. Complaints of thirst. Pulse good; no sickness. The wound not dressed.

3rd.—Progressing favorably. No return of pain, but she complains of slight aching in the face. Bowels moved slightly. The wound was dressed with carbolic oil, and looks well, there being only a little watery discharge from the opening, whilst the ends of the incision are quite healed.

4th.—Slept well; complains of pain and stiffness just below the ear, this part being also red and hard; in other respects she is much improved, takes nourishment well, and feels in every way better. A bread poultice was ordered to be applied to the inflamed surface.

5th.—Last evening had severe twitching and stinging sensations, with pain just beneath the tongue and by the side of the jaw; this, however, did not spread over the face, as it had originally done, nor was the pain so intense.

6th.—Had rather a restless night, the twitching still continuing, but with less severity; wound discharging more; the redness and hardness beneath the ear decreased; general condition still in every way good.

7th.—Is much better; has had but a slight return of the twitching sensation; bowels rather confined; wound doing well.

From this time patient went on uninterruptedly getting well, until Sept. 14th, when she had a slight return of the pain. On Sept. 18th she left the hospital for change of air, the wound having nearly healed.

25th.—Patient feels quite well, much better than she has done for some time; has had no return of pain.

27th.—Patient discharged to duty.

The only treatment found necessary in this case was an occasional dose of castor oil; no anodyne was required. The wound was dressed with carbolic oil, with the addition, after a time, of a

bread-and-water poultice; the nourishment consisted of milk, soup, beef-tea, pudding, and minced meat.

#### CASE OF STRANGULATED INGUINAL HERNIA; OPERATION; RAPID RECOVERY.

(Under the care of Mr. LANGDON.)

C. J.—, aged fifty-five years, a laborer, was admitted into the hospital at 11 P.M. on Sept. 4th, suffering from strangulated oblique inguinal hernia in the left groin. He had never worn a truss, and for thirty-six hours had suffered from the usual symptoms of strangulation. He had consulted his parish doctor, who had employed taxis after he had been placed in a bath. It was decided to operate at once, and, after the patient had been placed under the influence of chloroform, this operation was completed without opening the sac. There was very little hæmorrhage, and the edges of the wound were brought together with ordinary silk sutures. Carbolic oil, one in thirty, was applied, and the patient removed to bed.

Sept. 5th.—Patient slept well, and feels very comfortable; no sickness or pain. Pulse 84. Wound not dressed.

6th.—Feels quite well; bowels moved slightly. Wound was found quite healed. All the sutures were removed.

7th.—Patient allowed to get about the ward, wearing a truss. Bowels moved freely.

10th.—Discharged cured.

The diet consisted at first of slops, and was gradually increased.

#### ST. BARTHOLOMEW'S HOSPITAL, CHATHAM.

##### FIVE CASES OF LIGATURE OF THE FEMORAL ARTERY WITH ANTISEPTIC CATGUT.

(Under the care of Mr. NANKIVELL.)

CASE 1.—C. V.—, aged twenty-six, a cabman, was admitted on April 17th, 1871, suffering from an aneurism of the left popliteal artery, of the size of a small orange. Patient stated that he had noticed the swelling for about three weeks.

On admission, compression was applied, and continued daily at intervals for as long a time as the man could bear it till May 22nd, when, no result having been produced upon the aneurism, the femoral artery was tied with antiseptic catgut in the usual situation. The operation was performed strictly in accordance with the rules laid down by Mr. Lister. Lac plaster was used as the dressing. On June 12th the incision was found to be soundly healed. There had been an entire absence of supuration throughout.

CASE 2.—E. R.—, aged thirty-three, having previously undergone amputation of his left leg for diffused popliteal aneurism, was admitted on November 22nd, 1871, for a right femoral aneurism situated in Hunter's canal. On November 27th the artery was ligatured in Scarpa's space, carbolic catgut being used for the ligature, and the usual antiseptic dressings applied. The wound did not unite by first intention, but the pus never became putrefactive. The wound was found to be healed on December 28th.

He subsequently died at home of an aneurism of the aorta.

CASE 3.—J. S.—, a mineral-water maker, aged twenty-eight years, was brought to the hospital on June 20th, 1873, suffering from an aneurism of the left femoral artery, situated at the lower part of Hunter's canal. The man stated that twelve days prior to admission he noticed a swelling in the affected part. He could not account for the tumour by any fall or blow. The affected limb measured over the aneurism an inch and a quarter more than its fellow. Carte's tourniquet was applied.

July 4th.—The sac of the aneurism had become very painful. On measuring the limb it was found to have increased two inches since admission. In the afternoon deligation of the artery was performed, carbolised catgut and gauze dressings being employed.

25th.—Since the operation there had been a trifling discharge of aseptic purulent fluid from the lower part of the wound, which, on removal of the dressing, was found to be quite healed.

He left the hospital on August 6th.

CASE 4.—C. V.—, the cab-driver mentioned in Case 1, reapplied for admission on April 14th, 1874, suffering from a popliteal aneurism of the right leg, which had existed for the previous eleven months, but had got much worse since Christmas.

On April 24th the artery was ligatured, carbolised catgut and gauze being the materials used. The dressings were changed daily, owing to the amount of discharge, which was, on April 28th, distinctly fetid. There was also an erythematous blush of the leg and thigh.

May 3rd.—Suppuration more profuse. The gauze was discontinued and poultices applied.

21st.—An abscess had formed in the groin, which was opened. The wound in the thigh granulated rapidly, and was quite healed on June 17th, on which day the patient left the hospital.

CASE 5.—W. P.—, a waterman, thirty-nine years of age, became an in-patient on November 11th, 1874, suffering from a popliteal aneurism of the right leg. Six months ago the man was admitted, but he then refused any operative procedure. Having become worse, he was readmitted on the above date, and the femoral artery was tied with carbolised catgut on Nov. 13th. Dry lint was used as the dressing till Nov. 16th, when poultices were applied.

Dec. 23rd.—Patient allowed to get up. Wound now merely a small superficial ulcer.

He left the hospital on Jan. 18th, 1875.

*Remarks.*—The above five cases illustrate fairly what the antiseptic catgut can do. They are not brought forward as instances of the success or failure of the antiseptic treatment, but simply to show the results of catgut ligature on arteries deligated in continuity. In none of these patients was there the slightest sign of secondary hæmorrhage, nor was any portion of the ligature seen in the dressings. The wound was healed in twenty-one, thirty-one, twenty-one, fifty-four, and forty days respectively. In attempting to compare the period of cure of cases treated by catgut, on the one hand, and silk or hemp, on the other, it is difficult to arrive at satisfactory conclusions, because of the melting away of the ligature in the one instance and of the separation of the thread in the other. Mr. Nankivell does not think that the

presence of the catgut prevents primary adhesion of the deeper parts of the incision. At all events, he was not troubled by any sinuses, as has been stated to have occurred in some cases in the practice of other surgeons.

## CASHEL UNION HOSPITAL.

### SURGICAL CASES.

(Under the care of Mr. LAFFAN.)

WE are indebted for the following notes to Mr. James O'Dwyer:—

*Amputation of the Penis for Epithelioma.*—In the following case amputation of the penis was performed after the method proposed by Mr. Tyrrell of Dublin, which is as follows:—Before amputating, a strong pin is inserted through the crura of the penis in front of the pubis, and the pin is allowed to remain in that position for several days afterwards. After the organ has been removed, the urethra is slit up for half an inch, and its mucous membrane is stitched to the skin. The advantages claimed for the operation are that it prevents retraction of the stump of the penis, and that it greatly lessens the difficulty of dealing with subsequent hæmorrhage; and, lastly, that there is no liability to consecutive urethral contraction.

T. M.—, aged fifty-five, unmarried, a tailor by trade, was admitted on May 17th, 1875. The previous history was as follows:—He stated that he had enjoyed very good health up to September, 1874, when he noticed a little spot and hardness in the region of the glans penis. He also felt a pain in the arch of the foot. This pain, to use his own words, was accustomed to run up to the groin and out along the penis. He denied having had venereal disease, but admitted that he had not been of cleanly habits. He stated he was not a drunkard. On admission, the glands in both inguinal regions were slightly enlarged. He passed a large quantity of water, and had frequent calls to micturate. The penis presented a very ugly appearance, being greatly enlarged, indurated, and ulcerated through in many parts. The case being clearly one of epithelioma in an advanced stage, removal was resolved on. On May 18th the patient was placed under ether, and amputation at the pubic arch was performed. Very little bleeding occurred in this case. The mucous membrane of the urethra and skin united in a few days. No stricture ensued, and he left hospital on June 28th following perfectly well, and continues so up to present date.

*Necrosis of Circular Piece of Front of Tibia.*

—J. H.—, aged thirty-two, married, a laborer, came to the hospital on July 20th, 1874, with disease of the leg. The disease, which occupied the diameter of about a crown-piece, and extended half an inch in depth, was caused by a blow of a stick whilst hurling. The man was strong and robust; but as the reparative processes had hitherto been all but stationary, and so much time would be required for the complete throwing off of the dead part, Mr. Laffan deemed it advisable to save time by operative interference (a point of very much consequence to a poor day laborer). He therefore resolved to gouge away the dead bone, which was accordingly done on the 30th August. Antiseptic dressings were employed. The situation of the

necrosed bone did not admit of any covering of soft parts being provided from neighboring tissues. It was interesting to observe how this want was supplied by the perfect coat of granulations thrown out by the cut surface of the bone. Another point of interest was the death of a small rim of periosteum, which was left around the margin of the bony cavity, and the shooting up of granulations by the underlying bone. The cavity left by the removal of the dead mass filled up after a few weeks in a complete manner; and the patient left the hospital well, and continues so up to the present time.

*Spermatorrhœa.*—Several cases of the above-named affection have presented themselves, and the same difficulties have been encountered in their treatment as have beset most practitioners in dealing with similar cases. The entire success which attended Troussseau's compressor in one of these cases makes it worthy of special mention.

J. R—, aged twenty-eight, a policeman, had suffered for six years from seminal emissions, which were brought on by the usual causes. He had been under treatment a long time, but without benefit. Mr. Laffan, under whose charge he then came, also tried for some weeks various remedies, but with a like unsatisfactory result. He then ordered a compressor, which was to be worn every night. This did its business so admirably that on no night on which it was worn did any discharge whatever occur.

#### NORTH-EASTERN HOSPITAL FOR CHILDREN.

##### PROBABLE REDUCTION OF INTUSSUSCEPTION BY COPIOUS INJECTION WITH THE BODY INVERTED.

(Under the care of Mr. WARREN TAY.)

In the following cases the value of copious injections, while the pelvis was raised, was well exemplified.

An infant, aged seven months, came under care Sept. 26th, 1874. On the previous morning it was taken ill suddenly, began to strain to pass a motion, seemed in pain, and passed only blood and slime, and was sick. Mr. Butlin and Dr. Dixon, of Victoria-park, saw the child, and suspected that intussusception had occurred. Air was injected with a pair of bellows, but no relief followed. When seen, about thirty hours after the commencement of the symptoms, the child was straining constantly, as if about to pass a motion, and seemed in pain. A finger passed up the rectum encountered some obstruction high up, which felt as if it might be the lower end of an intussusception, but it was so high up that this could not positively be stated to be the case. When withdrawn, the finger was covered with blood and slime. No definite tumour could be felt on the left side through the abdominal wall.

A quantity of lukewarm water was injected into the rectum while the child was held up by the feet. As large a quantity as possible was injected. The child seemed relieved immediately the fluid was allowed to run out, and on examination by the rectum no sensation was communicated to the finger similar to that felt before the injection. When seen the next day, the child seemed quite

lively and well, and had remained so when heard of some time later.

Straining, accompanied by the passage of blood and slime by the rectum, and the presence of blood and slime in the rectum, detected on examination, are so fairly characteristic of the occurrence of intussusception in children, that the diagnosis in this case admits of little doubt. It is confirmed by the probable presence of a bulging within the rectum, and by the great and immediate relief which followed the treatment adopted. It is probably not very material whether air or water be injected, but it is very important to have the patient held up by the heels. Mr. Hutchinson has repeatedly insisted on this. An American physician (Dr. Battey) has lately stated that fluid can be made to gravitate slowly through the ileo-cæcal valve, along the whole tract of the small intestine, through the stomach, and even out of the mouth. However this may be, there can be no doubt that in certain cases of obstruction of the bowels the injection of copious enemata during or followed by inversion of the body, and, if necessary, whilst the patient is under the influence of chloroform, is succeeded by complete relief, even where the symptoms are very acute. A case of this sort came under Mr. Tay's care at the London Hospital in 1872. It is sometimes difficult to ascertain when the injection has been carried far enough in cases of intussusception. A child aged fifteen months was taken to the North-Eastern Hospital on June 8th, 1870, suffering from an intussusception of twelve hours' duration. It could be felt just within the anus. The child was sick, had passed blood and mucus, and seemed in great pain. The invagination could not be replaced with the finger, but when warm water was freely injected, the tumour which had been felt slipped out of reach, and great relief was apparently afforded the child. It was considered that the intussusception had been reduced. The child, however, continued to pass only bloody slime, and when seen the following day some tumour could be detected as high up as the finger could reach. A copious injection was again thrown up, while chloroform was given, and the child was inverted, but no change was produced in the symptoms. The child lived for six days altogether, and at the post-mortem an exceedingly short invagination of the transverse into the descending colon was found. There were no traces of peritonitis, and the invagination was easily reducible. Probably more perseverance at first, after the injection had seemed successful, would have completed the release of the bowel. This case showed the fallacy of being deterred from operative procedures on the supposition that peritonitis must necessarily have set in and that the parts were glued together.

#### STANLEY HOSPITAL, LIVERPOOL.

##### SUCCESSFUL CASE OF HERNIOTOMY; REDUCTION OF LARGE MASSES OF OMENTUM.

(Under the care of Mr. RUSHTON PARKER.)

*Old omental hernia; strangulation of ileum; sac congenital.*—A laborer, aged fifty-two, had had for two years a reducible left inguinal hernia, which he kept up easily with a truss. For about



thirty years he had had an irreducible right inguinal hernia, for which he had never worn a truss, and which increased in size at times, the increase having always disappeared when he lay down.

On the 1st April, 1875, this additional portion came down soon after mid-day, when he had eaten an unusually hearty dinner, and he could not reduce it. For two days he remained at home, unable to work, or eat, or rest, and he came to the hospital on 8rd April among the out-patients.

On admission he had a large three-lobed tumour of the right scrotum, the smallest lobe being in front and having the size and shape of a testicle, but feeling as if it contained fluid. No translucency, however, could be detected in any part of the swelling, which also was everywhere dull on percussion. There was pain in the abdomen, which was tense, but not enlarged, and he appeared thoroughly uncomfortable, and rather restless, though not anxious or seriously distressed. The pulse was not perceptibly abnormal, and there was an entire absence of vomiting. An occasional eructation, however, gave a clear warning of impending strangulation of an obstructed hernia.

He was put to bed with the pelvis raised and knees flexed, and had a quarter of a grain of morphia subcutaneously every four hours, after a reasonable trial of taxis, which failed. Three or four hours later he vomited a glass of brandy-and-water which had been given him, and twelve hours after admission regular stercoraceous vomiting set in and lasted at moderate intervals for six hours more, when he was put under chloroform.

The operation was performed fifteen hours after the first act of vomiting, six hours after the first appearance of stercoraceous matter, and exactly three days after the descent of the hernia. A vertical incision was made down to the external oblique muscle, and an attempt made to reduce the hernia without opening the sac, by first incising the edge of the external ring, but this failed. The sac was opened, and a piece of small intestine was found extending down into mid-scrotum. A narrow neck was found at least two inches below the external ring, much less than half an inch wide. This was incised, and a couple of inches of gut, slightly reddened but uninjured, was liberated, and returned with the portion above into the abdomen, constantly irrigated, after exposure, with 1 per cent. carbolic lotion (the spray apparatus not being at hand). About three-quarters of a pound of omentum was next pulled from the scrotum, passing through the narrow neck by a still narrower pedicle, and being found quite healthy was returned into the abdomen, after being well washed with the carbolic lotion. Much fluid escaped with the release of the omentum, which was found to occupy a congenital sac, the small diverticulum of which was stripped up and cut off.

The inguinal neck of the sac was sown up with carbolised catgut, and carbolised waxed silk sutures were used for the external wound.

The abdominal part of the wound healed without suppuration, but pus formed in the scrotum by the fourth or fifth day. The man was up wearing a double truss in five weeks. In spite of the continual administration of morphia or opium, he had stools each day after the operation for several days, but, fortunately, without harm. He vomited twice after the operation on the same day; and on the fourth day was much distressed by hicough for many hours, but this disappeared at once on his

following an old popular plan of slowly sipping some liquid (milk in this case) as long as he could without breathing.

### DORSET COUNTY HOSPITAL.

EXTENSIVE INCISED WOUND THROUGH THE CALF OF THE LEG; IMPORTANT AND SATISFACTORY USE OF THE CARBOLISED CATGUT SUTURES.

(Under the care of Mr. JOHN TUDOR.)

B. P—, laborer, aged twenty-three, was admitted into the hospital late on the night of August 23rd, 1875, with a semilunar incised wound through the calf of the leg, about ten or eleven inches in length, the course of the wound being in a direction from below upwards, having very much the appearance of a posterior flap in an ordinary amputation. The soleus and gastrocnemius muscles were cut through, and part of the flexor longus pollicis. The accident occurred in the harvest-field, owing to the man running across a scythe whilst chasing a rabbit at full speed.

In consequence of the upward course of the wound, no important vessels were injured. One which bled rather freely was ligatured, and another twisted. The chief difficulty presenting itself was the retraction of the muscles, even to the extent of several inches when the knee was fully flexed, rendering it impossible to secure them in the same sutures as the skin. Taking this into consideration, the muscles were separately brought together by means of carbolised catgut. The sutures were passed, about an inch from their margins, through the entire thickness of the muscles, and tightly secured, thus bringing the opposed surfaces together firmly. Their ends were then cut short off.

The skin was brought together by twelve silver wires; the wound was covered with carbolised oil, lint, and tow; the knee was flexed and secured by a bandage passed over the foot and made fast to a belt around the waist, the limb being then raised and placed upon pillows, resting on its outside. The progress of the case was very satisfactory, the wound healing chiefly by first intention. At the end of three weeks the patient was convalescent and able to walk quite comfortably, and was discharged Sept. 23rd, a month after his admission.

## Editorial.

### THE USE OF THE COLD BATH IN TYPHOID FEVER.

THE employment of the cold bath as a routine treatment in cases of fever has only of late years come into vogue in this country; and even yet it has been carried out but indifferently, and has not received the full amount of attention that it deserves. It is too often restricted solely to cases of



hyperpyrexia, and its full value as a great and powerful antipyretic agent has yet to be appreciated. One of the greatest obstacles in the way of its employment lies in the trouble and disturbance involved in the procedure; but even these are but minor difficulties in the path which cannot prevent its general adoption if it be really of such value as its supporters make out. Professor Liebermeister has long been known as one of the highest authorities upon febrile diseases; and his article on Typhoid Fever in the new "Cyclopædia of Medicine" is one of the most valuable contributions to medical literature that have appeared in our day. We propose to review here the arguments which he adduces in this article in favor of the employment of the cold bath, taking occasion to point out in what direction his method departs from that usually followed in this country. The material he has had to work upon has, indeed, been vast; for, as he tells us, in six years—viz., from 1865 to 1871—no fewer than 1900 cases of typhoid fever passed under his care at the hospital of Basle! For the purposes of comparison, however, between the cases treated prior to the general adoption of the cold-water plan and those subsequently so treated, Liebermeister takes but 1743 of those cases; of which, 861 were treated under the old *régime*, and 882—the total of the last three years—upon the new system.

Starting with the axiom that by "far the greater number of those who succumb to typhoid fever die from the effect, directly or indirectly, of the fever heat," Liebermeister points out that antipyretic therapeutics must form the basis of the rational treatment of this (as of any other) fever. And chief among all antipyretics is to be ranked cold water, of which the history of its introduction as a therapeutic agent by Currie in the eighteenth century, its subsequent neglect, and its revival on the Continent in comparatively recent times, is now too well known to bear repetition. Brand and Jürgensen, however, deserve to be remembered for the active part they took in the advocacy of this method, and to them Liebermeister accords all due honor. He then proceeds to give brief but clear directions as to the best means by which such treatment can be carried out, premising that, although the main object is the abstraction of heat from the body, the manner of performance should be such as produces the desired result with the least inconvenience to the patient. We know no work, except that of Brand, wherein such rules are so precisely laid down as they are here. Authorities—in this country at least—differ as to the degree to which the water in the bath should be heated when the patient is first put in it—whether it should be, say, 90°, and then gradually cooled to 70° or lower; they also differ as to the duration of the bath—whether this should be prolonged until the temperature of the body falls to normal, or whether

it should be comparatively short and reliance be placed on the subsequent fall (which invariably occurs) in the temperature of the body. We have known cases where, in spite of the cooling of the water, the time taken in the fall of the body temperature has been so slow that the patient has been kept in the water for an hour and a half, supported by stimulants, taken out almost in a condition of collapse, and requiring the application of external warmth to neutralise the depressing effects of the long immersion. Such treatment Liebermeister sternly discountenances, and, however much it may have produced the desired effect of reducing the temperature, it is surely at the expense of the patient. Moreover, in such cases, the reaction is often disagreeably sudden and severe, so that within an hour or two the whole process has to be repeated. The plan followed by Liebermeister is, in brief, this: The patient is wholly immersed in water at a temperature of 68° F. The duration of the bath does not exceed ten minutes, and in the cases of feeble persons the duration should even be reduced to seven or five minutes. A short cold bath, he avers, has much better effect than a prolonged tepid one; except, again, in the case of very prostrate patients, for whom a bath of 95° gradually cooled to 72°, as recommended by Ziemssen, is to be preferred. The indication for the bath is the safe and sure one obtained by the thermometer, a temperature of 103° in the rectum or 102.2° in the axilla being the usual limit to be allowed before having recourse to the bath. The frequency with which the bath should be repeated is entirely governed by the same standard; and, other things being equal, the number of baths required will be in exact proportion to the severity of the fever, the severest cases requiring a repetition of the treatment every two hours; while in some instances, Prof. Liebermeister tells us, the total number of baths required by one patient during his stay in hospital exceeded two hundred. As a rule, however, four or eight baths per diem suffice.

We have dwelt thus fully on the directions of Professor Liebermeister because it seems to us of the highest importance that, if this treatment is to be introduced into this country with any measure of success, it can only be by the adoption of a uniform scientific method, and not by the restriction of the treatment to cases on the verge of death from hyperpyrexia, nor by a too blind adhesion to the belief that a mere reduction of the temperature of the body to the normal is all that is requisite. Before, however, urging the general adoption of these measures, which would have to be applied in almost every case of fever, it is but right that the evidence adduced in its favor by Liebermeister be considered. This we may now proceed to do.

First of all comes the question of the effect of the bath on the course of typhoid fever itself.

Does it in any way hasten the process of recovery, and help in the elimination of the poison? To this question a negative answer must, we think, be given. And at first sight even facts seem to point the other way; not that the duration of a first attack is retarded, but that it renders the patient more liable to relapse. Thus Liebermeister gives a percentage of relapses of 7.4 before the introduction of this treatment at Basle, as against 9.4 after the innovation; while the mortality in the relapse was five times as great. But he at the same time points out a fallacy in taking these statistics, which are based on the whole number of cases under treatment; for he says that formerly the mortality in the first attack was higher than now. Taking, then, only those cases in which a first attack has been passed through, the relative proportions of the two percentages are diminished, being on this basis as 9:10.8, instead of as 7.4:9.4. It must be borne in mind that relapses may occur more frequently now simply because those patients would have died earlier had not the cold bath been employed. However, he believes the question to be an open one, the evidence being in favor of a progressive increase in the frequency of relapses *pari passu* with the more extended application of this method. The same fact has been noticed by Biermer.

One other question of great practical import in the use of cold water in typhoid is that which relates to pulmonary complications, so frequent and so baneful in their effects. Here the balance of statistical evidence adduced by Liebermeister is strongly in favor of the treatment. Thus, using the same number of cases already mentioned, he has noticed that, whereas before the treatment the frequency of pneumonia was 7 per cent., with a mortality among those so attacked of 50 per cent., since the cold-water treatment the average frequency of this complication has fallen to 6.4 per cent., and its mortality to 80 per cent. This diminution in the fatal cases of pneumonia is one of the strongest arguments in favor of the general adoption of this method. A like satisfactory and well-marked diminution in the frequency and mortality of hypostatic congestion and other pulmonary complications has also been noted, so that he says with truth that "affections of the respiratory apparatus occur rather more rarely and run their course with less severity under the cold-water treatment than under any treatment which is not antipyretic."

There is no need to point out further the value of the bath as a sedative—its marvellous effects in calming delirium and all the series of nervous symptoms attributable to high temperature,—for these are well known and have been fully insisted on by all those who have recorded cases of hyperpyrexia so treated. Nor is there any need to point out how it acts in steadying and controlling the

action of the heart, changing in a brief space a feeble threadly pulse into a moderately full, regular, and soft one. The simple fact that remains from the study of such advocacy as is here presented to us by Liebermeister is: that, of all antipyretic agents, the cold bath stands pre-eminent (over even other modes of cooling—as by affusion, the wet pack, &c.) both as to its certain action and as to its ready application. We can do no more than urge our readers to the perusal of this valuable and suggestive monograph, which will do much to establish the "Cyclopædia of Medicine" in the high rank it promises to take. If every article in the fifteen (or more?) volumes contain as much original thought and clear statement as this one, the work will indeed be of enduring value.

### THE PATHOLOGY OF THE SMALL-POX OF SHEEP.

A SHORT time has only elapsed since we called attention to some very interesting and important researches by Dr. Klein on the Lymphatics of the Lungs having a direct bearing on the process of acute military tuberculosis; and we have now to place before our readers the results of an equally elaborate investigation by the same indefatigable observer on the Small-pox of Sheep, a disease that very closely resembles variola in man, and a knowledge of which will undoubtedly materially elucidate our conceptions of the exanthemata generally, showing, as these observations appear to do, that variola, at least, is due to the development of a special form of fungus. The lymph was obtained from Professor Chauveau, and inoculation was practised in the skin of the groin on the 8th of December, 1878. On the 18th most of the punctures were surrounded by a raised red areola; these gradually increased in size till the 15th, when they became depressed and pale in the centre. The temperature of the animals rose at first slowly, then rapidly, but fell when the pocks ceased to increase in size. The pocks were excised at various stages, and immersed for a few days in very weak (1-5 per cent.) solution of chromic acid.

Careful examination of the lymph showed the presence of—1. Minute highly refractive spheres, isolated, or in couples, or in small groups; they correspond to the micrococci of Cohn, and exhibit Brownian movements. 2. Decolorised blood-corpuscles. 3. A few rod-like bacteria, of the types termed by Cohn "termo" and "subtilis." 4. Lumps of a pale transparent substance, with irregularly distributed larger and smaller granules. 5. Several forms of spheres, some larger than the decolorised blood-corpuscles, some smaller. If the lymph be placed in an incubator for twenty-four hours, the pale transparent masses above alluded

to become more or less distinctly fibrillar, and appear to consist of a feltwork of very delicate branched filaments, in or on which the highly refractive granules are found, and these in the course of another twenty-four hours become enlarged into the spheres of various size. It is worthy of notice that the few rod-like bacteria disappeared completely after the preparation had been kept in the incubator for twenty-four hours or more. The refractive granules, when small, are of a slightly greenish color, and proliferate with extraordinary rapidity of transverse fission, forming necklaces, of which the micrococci constitute the beads and a transparent connecting substance the thread. When these necklaces become closely packed, they constitute a *colony* or *zooglæa* of Cohn.

On making sections of primary pocks which had only appeared for from six to twelve hours, the characteristic points observed were that the epidermis had undergone considerable increase in thickness, owing chiefly to the swelling of the cells of the rete mucosum. The papillæ of the corium had also become broader and longer. The blood-vessels were distended, the endothelial cells being swollen, distinctly granular, and containing enlarged nuclei. The tissue of the corium, in general, was slightly œdematous, and the lymph-canalicular system larger and more clearly visible; colorless blood-corpuscles had made their way out of the vessels. The general appearances were therefore those of slight inflammation.

Pocks that had existed for twenty-four hours presented all these characters in a more marked condition. The cells of the rete Malpighii had undergone division, and the infiltration of the corium with lymph-corpuscles had greatly increased. In addition, the interfascicular or lymph-canalicular spaces contained a firmly granular material, in which were embedded peculiar ovoid or spherical sharply-outlined structures, containing in a clear substance one large, or two, three, or four small highly refractive bodies. Dr. Klein proceeds to contrast these with connective-tissue corpuscles and their nuclei, with pus- and lymph-cells; and shows that by the difference of their microscopical characters and reactions they must be regarded as bodies foreign to the structure of the skin, and, in fact, that they may be regarded as a *fungus*. Many of the lymphatics contained a material composed of a transparent matrix, in which were embedded highly refractive granules; and a few hours later the granules were seen to be arranged in shorter or longer, branched or unbranched filaments. When forty-eight hours had elapsed the granules were found not only to have arranged themselves into filaments, but the filaments had more or less lost their granular aspect, and had become smooth, longer, more branched, highly refractive, and slightly greenish. The mycelium thus formed then fructifies, forming

conidia, like an *oidium*. In the earlier stages of the disease it is most abundant in the deeper stratum of the corium; but subsequently it appears in the superficial stratum and in the superficial stratum of the subcutaneous tissue, from which it may be traced for long distances through the lymphatics.

Further observations showed how it comes to pass that the central part of the pock is depressed and pale as regards the peripheral portion. It becomes depressed because a great number of layers of the original rete Malpighii undergo conversion into layers of horny scales, while the deep stratum of the rete grows very actively into the corium; and it becomes pale because the central portion is covered with a thick, horny, dry membrane, formed by the condensed layers of the rete.

Lastly, Dr. Klein gives the results of his examination of the pustular stage of the development of the primary pustules; and states that pustulation commences by the formation of isolated vesicles in the rete Malpighii, which, as they gradually increase in number and size, become eventually fused together to form larger cavities and canals. The formation of the vesicular cavities invariably depends on the transformation of individual epithelium cells of the middle layer of the rete Malpighii into spherical or elliptical vesicular structures, possessing a thick membrane and clear contents. As they increase in size the contents come to consist partly of lymph-corpuscles, but principally of mycelium, which may or may not be in fructification. Many of the lymph-corpuscles themselves contain a number of spherical bodies of greenish color, which appear to be spores.

It would seem from all this that we are now in possession of substantial evidence that variola, if not caused, is at least accompanied, in the sheep, by the growth and development of a peculiar fungus which makes its appearance in the tissue of the corium and its lymphatics, and is gradually carried or penetrates into the vesicles formed in the rete Malpighii. This fungus, Dr. Klein proposes, since he has been unable to identify it with any described species, to call the "*oidium variolæ*"; and adds that it is a very important question, and one deserving alike the attention of physicians and anatomists, whether any form of vegetation corresponding to it is to be met with in the cow-pox or in human small-pox.

Dr. Klein's researches appear in the just issued part of the Philosophical Transactions, and have been communicated by Mr. Simon, at whose instigation they were made. They are illustrated by most beautifully executed plates.

## MILD CASES OF TYPHOID FEVER.

DR. W. W. JOHNSTON, one of the physicians of the Children's Hospital, Washington, has contributed a paper to the last number of *Hays's American Journal of the Medical Sciences*, containing observations that are not without practical significance and bearing at the present time, when typhoid fever is unduly prevalent. The author deals with the diagnosis of mild cases of enteric fever, and specially refers to its afebrile and abortive forms. The departures from the accepted type are in two directions: either in a loss of intensity of the morbid phenomena, with a feeble development or absence of the pathognomonic symptoms; or in a considerable shortening of the attack. Embarrassments of diagnosis will occur in such mild and short cases. Dr. Johnston passes in review the symptoms most commonly associated in cases of typhoid fever infection. Those whose experience of this disease is most extensive will be the readiest to recognise the wide range in point of severity and duration and the diversity of the morbid manifestations in different cases. Easy as it is to diagnose the well-marked type of the disease, it is not by any means invariably so in cases of different and less pronounced character. After insignificant symptoms perforation of the bowel may ensue, and the same may occur where diarrhoea has been absent; tympanites may not be present, or at any rate observed; and the intestinal disturbance and abdominal symptoms may, in short, be trifling or altogether absent. The same may be said of the rose rash, enlargement of the spleen, and other ordinary concomitants of typhoid. But as regards pyrexia—undoubtedly the most constant symptom of the disease, and the best test by which we can gauge the gravity as well as determine the nature of the morbid process,—can we say that every case of typhoid disease must of necessity present an increase of animal heat? Dr. Johnston cites the experience of Liebermeister and others to show that there is a typhoid infection without fever, and refers to the fact that in Basle, where typhoid fever prevails to a great extent, it is not uncommon to find an evident enlargement of Peyer's patches in persons who have died of other diseases or from accident. Cases may be reckoned mild which have no higher evening exacerbation than 104° Fahr., or in which this point is not attained more than once or twice. Starting from this we pass from degree to degree in the descending scale until we reach afebrile states; and the author relates some cases illustrative of these low-temperature readings where there was no reason to doubt that the patient's disease was still typhoid fever. He next refers to the so-called "abortive typhoid"—a term suggested by Lebert as applicable to cases first described by

Griesinger, and since by Wunderlich, Jürgensen, and others. The typhoid infective agent has a virulence which is by no means the same under all circumstances, and the limits of variability are known to be very wide. In the same house, says Dr. Johnston, may exist cases which react in very different ways to an infection which seems to be the same; and he thinks that different cities and countries may probably present peculiarities, and it is for the future to determine in what these peculiarities consist. The points in which the typhoid fever of America differs from the European disease are briefly adverted to by our author. The practical lessons connected with the recognition and study of these varieties seem to be two:—First, that the mild cases, corresponding to the typhus ambulatorius, may receive prompt and proper treatment, so that the disease be not aggravated or protracted; and, secondly, that they be prevented from becoming unsuspected sources of infection to other and healthy people.

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## Medical Annotations.

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"Ne quid nimis."

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### ARISTOTLE'S NOTION OF RIGHT-HANDEDNESS.

MR. PEARSON, of Emmanuel College, lately read a paper before the Cambridge Philosophical Society on "Aristotle's Notion of Right-Handedness," and added some remarks on a theory of his own on the subject. After referring to the paper by Dr. Hollis on this subject, communicated last year (Nov. 30th, 1874: *Journal of Anatomy and Physiology*, vol. ix., p. 263), the speaker stated that he had been led by Aristotle's great reputation to inquire what his views on the subject might have been. Partly from a perusal of much that Aristotle has written on the subject, but mainly from the new Index by Prof. Bonitz, he gave a *résumé* of the passages bearing on the subject. These passages seemed to show that Aristotle considered (1) that the right hand or side was naturally the source or origin of motion, (2) that in nearly all living creatures capable of motion it is the better or stronger side, (3) but that while the heart is always the origin of vitality, it is in the human race only set towards the left side of the body; in all other living creatures it is in the centre of the body or trunk (*ἐν μέσῳ καὶ τοῦ ἀντακτοῦ σώματος*). And though it may be a fair question how far Aristotle was misled by the preferential use of the right hand by the human race to attribute an excellence in the right side to the animal world, there can be no mistake about the distinct language in which he does so. Some observations were added about the terms in which Mr. Lewis in his work on Aristotle (1864) criticises some errors into which that writer has fallen in his works on Natural History, while it was admitted that he is probably right in considering that there is no reference in Aristotle's writings to the anatomical

examination of any but animal subjects; though the fact that Macrobius ascribes to Erasistratus and Herophilus, two celebrated physicians of the succeeding generations, the practice not only of dissection but of vivisection of human bodies, shows, if the story is true, that public opinion could not have been quite unprepared for it. Mr. Pearson also referred to a passage in the *Encyc. Britann.*, art. Comp. Anatomy (§§ 202—205), ed. 1810 (but not occurring in later editions), in which the preferential use of the right hand is discussed, and ascribed to a natural peculiarity in the form of the subclavian and carotid arteries on that side, and in which it is stated that a similar preference for the right side may be traced in some dogs, if not in horses. The speaker said, however, that he would not answer for the existence of such a preference himself in those animals, nor in the lion and camel, to which Aristotle (and Pliny after him) especially ascribe it. He concluded by exhibiting a lobster, of which the right claw is distinctly larger and stronger than the left, as is specially mentioned by Aristotle (*οἱ καρκινοὶ... τὴν δεξιὰν ἐχονσι χηλὴν μείζω καὶ ἰσχυρότεραν*...).—Mr. Neville Goodman considered that the paper had only shown the superiority of the inductive to the speculative method of reasoning, although proving Aristotle's skill in adducing facts from the great repository of nature in favor of his own view. He quite admitted that many facts indicate the right side as having a preferential motor function. In addition to the examples given, the whole order of Gasteropods were mentioned as having their chief organs on the same side, while the ordinary snail exhibits an excessive development in the same direction. To this rule, however, there are many exceptions. Again, the flat-fish (Pleuronectidae), though quite asymmetrical in their form, have not by any means always their motor function to the right; the sole being generally developed to the right, the turbot to the left. He doubted the preferential use of the right side in animals; and though in ancient art the left leg is advanced, the position he thought purely conventional.

#### THE HARVEIAN LECTURES.

THE second of these lectures, on Bright's Disease considered in relation with arterial tension from blood contamination, was delivered before the Harveian Society on Thursday, the 9th Dec., by Dr. Sibson, to a numerous and appreciative audience. The greater part of the lecture was occupied in the demonstration, by means of the oxyhydrogen lamp, of the sphygmographic tracings of the pulse in cases of the different forms of Bright's disease under varying conditions of pressure and tension. Of these, although of great interest, it is impossible to give any idea without the aid of diagrams. Dr. Sibson exhibited a sphygmoscope which he has long used to estimate the pressure in the vessels, and also a modification of the sphygmograph, in which, by means of a screw, the pressure can be more easily and rapidly regulated than in Dr. Sanderson's modification of Marey's instrument. In the latter portion of the lecture Dr. Sibson took up the subject of treatment, classifying the therapeutic measures under three heads. These were, first, to promote the elimination of the effete products from the blood by the various channels; second, to avoid the introduction of other poison-

ous material which could tend to aggravate the condition of the blood; and, third, to enable the patient to live above and in spite of the blood condition. To fulfil the first indication, the ordinary measures were recommended. Under the second heading, Dr. Sibson dwelt especially on the importance of feeding the patient on substances which are free from the products of tissue oxidation and yet afford a great amount of nourishment; and on this ground he strongly recommended milk as a diet in preference to beef-tea, the latter containing so large a proportion of extractive matter. The drinking of pure water, such as Malvern water, or of soda water in quantity, was also advised. On the other hand, the lecturer eloquently enforced the danger of administering alcohol in such cases; he regarded it as only adding fuel to the fire, and overloading the blood with a poison which in itself is liable to set up similar changes in the blood and vessels to those induced by the morbid poison of Bright's disease. He allowed, however, that in some cases the administration of alcohol seemed to give tone to the system, and enabled it to excrete the morbid materials more readily. The employment of opium or morphia, whether subcutaneously or otherwise, was justly condemned in strong terms in cases where there are albuminuria or signs of renal and vascular degeneration; and the lecturer urged the importance of examination of the urine before the administration of these drugs.

Finally, in order to enable the patient to live above the influences of his disease, Dr. Sibson strongly recommended that plenty of exercise should be taken, since the muscular action not only enables the heart to perform its work with less effort, but promotes elimination. Cheerful society, healthful bodily and mental work were, he considered, far better than inaction, for by means of them the healthful balance of function and the mutual reaction of organs might be maintained even with a partially diseased organ, and the patient be thus in a state of relative, if not of actual health. Dr. Sibson concluded an interesting lecture by thanking those who had enabled him to undertake and assisted him in a course of investigation at various hospitals, which had extended over many months.

#### DIPSOMANIA.

OUR contemporary, the *Globe*, has recently commented at some length upon the able article on the subject in the current number of the *Quarterly Review*. To the instances of the abuse of alcohol which cry with keenest if not with loudest voice for interference, the writer adds another. In addition to the prevalence of the vice among women, boys are yielding to the temptation. At an age when reflection sets so few barriers against wrong, the chains of alcohol may easily be riveted before their weight is felt. It is authoritatively stated that this is the case, and that the habit of secret drunkenness is becoming common among boys at public schools, to an extent which the friends of the sufferers would willingly conceal. It may be hoped that the case is exaggerated, but knowledge of the even worse habits sometimes acquired at public schools forbids us to doubt its probability. The dissemination of precocious vice has ever been an unhappy consequence of the example of

the contaminating few in large schools. Readers of a popular school-boy novel of twenty years ago will remember how powerfully this result was brought out in the delineation of the downward moral course of certain boys. It cannot be doubted that the same influences are, and always will be, at work in this and in other directions.

Our contemporary urges a milder measure of interference than will, we believe, effectually meet the necessities of the case. It points out the striking anomaly to which we some time since called attention, by which habitual drunkenness is allowed and suicide forbidden, but it urges merely the legalisation of "voluntary restraint," if the expression may be excused. It asks for a measure which shall permit the dipsomaniac in his sober moments to place himself in a restraint which he shall not leave in his unsound period, and it would merely give power to others to enforce such seclusion in the case of minors. It would further, as far as we understand it, limit such seclusion to the unsound dipsomaniac, who is urged onward to his fate by what the *Quarterly Review* calls the *vis a tergo*, and would not include the habitual drunkard, who merely yields to a temptation which he might withstand. It may be doubted how far any line can be drawn between the two classes, except that of frequency of intoxication. The *vis a fronte* and the *vis a tergo*, the temptation and the impulse, are, in reality and essentially, one in nature. Their extreme degrees are separable, but they blend. The temptation often yielded to, involves, by the alcoholisation of the system, the incapacity for resistance which in its extreme form constitutes the impulse. Compulsory privation from alcohol lessens the attraction of the temptation as it lessens the force of the impulse. We believe that the larger measure must ultimately come, and we would urge that the demand should not be restricted to the smaller instalment, even though we may ultimately have to be content for a time with the "voluntary restraint."

#### EMBOLISM OF FAT AFTER FRACTURE OF BONES.

OBSTRUCTION of lung capillaries by fat has been found at post-mortem examinations, though injection of pure oil into the veins of animals cannot, as it appears from experiments of F. Busch and Bergmann in Dorpat, set up inflammatory action and formation of abscess. Busch, however, succeeded in some experiments conducted in Recklinghausen's Pathological Institute, in causing embolism and sudden death by rough handling of broken bones, and in proving that from the fractured spot particles of bone-marrow had been sucked into the torn veins, and carried on into the vessels of the lungs. Dr. Czeray, Professor of Clinical Surgery in the University of Freiburg, gives in the *Berl. Klin. Wochens.*, No. 44, the history of a case in which a healthy, robust mason, aged thirty-two, had his right thigh-bone broken, and died thirty-eight hours after this uncomplicated fracture with symptoms of acute obstructions in the lungs and brain. The autopsy showed a large extravasation of blood around the fractured bone-ends, in which great quantities of coagulated fat-drops could be seen floating. The broken surfaces appeared jagged on a fine splinter still connected with the periosteum. The smaller arteries and capillaries of the lungs appeared under the

microscope distended with clear liquid fat throughout all parts of both organs, the right one being perhaps more filled with fat than the left. Boiling in ether drew the fat off. The endothels of the lung-cells of such pieces appeared richer in protoplasm, and their nuclei more distinct than in the normal state. In the smaller branches of the pulmonary artery quantities of coagula were found, which showed, microscopically, distinct fat-drops mixed with water. The same could be detected in the blood drawn from the femoral vein by means of a pipette. The brain showed on sectional surfaces numerous blood-spots in the cortical substance, some small, and at some places sufficiently numerous hæmorrhagic ecchymoses; the vessels leading to them were found under the microscope filled with branching emboli of fat. In the kidneys the vessels of the glomeruli were filled with fat. In the liver numerous small drops in the intra-lobular vessels could be seen, but no branching thrombus. No embolism was detected in the muscle of the heart. The filling of the lung vessels was of such extent that the obstruction of circulation, cedema, and carbonic-acid poisoning caused by it fully accounted for the sudden death, which might have been accelerated, as Dr. Czeray seems to infer, by the embolism of the brain. He thinks that cases of so-called traumatic delirium or reputed commotio cerebri may be caused by fat embolism after fractures. The pressure of the arterial blood flowing from lacerated vessels and the contractions of muscles may force the fat particles into the opened veins. Dr. Czeray contends, however, that a certain amount of fat embolism occurs with every fracture, and is easily overcome. As the melting point of human fat is as low as from 15° to 25° C., a febrile rise of the temperature of the body cannot cause any remelting of coagulated extravasations of marrow. Experiments on dogs to emulsionate injected fat by an after injection of a weak solution (two per cent.) of carbonate of soda always resulted in the death of the animals.

#### FLOCKS.

A CORRESPONDENT of the *Glasgow Herald* has called attention to a hitherto unsuspected source of disease. For stuffing beds and furniture a substance called "flocks" is in common use, and the source and character of this material are, it is said, such as to render it a most undesirable material for the purpose, and one not unlikely to be a ready and effective vehicle for the conveyance of contagion. The flock manufacturer collects rags of every kind, and for the most part of the most filthy material, "the pickings of ash-pits, the worn-out clothes of all classes, including the cast-off greasy tatters of the denizens of the slums and wynds of our towns and cities," and this material is, it appears, made up into flocks without any preliminary purification. The rags are dried, passed over revolving rollers with prongs of teeth, which tear them down to fibrous consistence, clouds of dust flying from them and passing up chimneys, to darken the air, and cover the surface of the neighboring land and houses.

There are, however, we believe, flocks and flocks—white flocks and black flocks, and the description we have quoted of the source of the material employed is true only of the coarser variety of black

flocks. It is indeed a loathsome substance—the rags from which it is made, and often the “flocks” itself, swarming with animal life, and it is utterly unfit to be employed for stuffing any article of furniture, far less bedding. But the “white flocks” is a very different substance; the best is a pure white soft cottony material, the product, we believe, of an Indian plant. It is preferable, in fact, to the imperfectly preserved and often not inodorous feathers, which are often put into beds. The black flocks is likely to be a grave source of disease, and we agree with the correspondent whose letter we have quoted, that its use should be conditional only on absolute purification. The matter is one which deserves and should receive the immediate attention of the sanitary authorities of the districts in which flock-mills are situated. We are not surprised to learn that the manufacture is a most unhealthy one, the health of the workpeople suffering very seriously from the contamination of the atmosphere produced by the flying particles of impurity.

#### FEEDING BY SUBCUTANEOUS INJECTIONS.

A METHOD of forcible alimentation, which possesses at least the merit of novelty, has recently been put in practice by Dr. J. Krueg, who narrates his experience in the *Wiener Med. Wochenschrift*. It consists in the injection of aliments into the subcutaneous tissue by means of a hypodermic syringe. Dr. Krueg recalls the fact that it has been shown by MM. Menzel and Pereo that nutritious matter may be absorbed in this way; a quantity of fatty liquid, from one to eight drachms, having been taken up in forty hours, and that solutions of sugar, milk, and yolk of egg act in the same way. Peptones have also been shown to be thus absorbed by Stricker and Oser. Dr. Krueg tried the method in a case of insanity with refusal of food, in which, the patient having been nourished for twenty-seven months by means of the stomach-pump, and the introduction of the tube becoming difficult from his violence, at one time it could only be introduced once in ten days. Dr. Krueg, therefore, injected about half an ounce and then one ounce of oil daily beneath the skin, dividing this quantity between from two to five different points of injection, the operation being done gradually, and lasting about an hour. The injection was not painful, and the swelling disappeared by the next day. Beaten-up egg was not so successful, producing an abscess. For nine days at a time the patient was entirely dependent on this process for nourishment, which was subsequently repeated several times. We need scarcely say that this method of feeding is one not likely to be of much use; and, indeed, it seems to have been required in this case only because the old and barbarous method of feeding by the stomach-pump was employed, instead of the more simple and expeditious way of feeding by the nose. As a means of inducing unwilling patients to take food, the punctures required may have as much value as any other mode of torture; and, indeed, some temporary result of the kind seems to have been gained in the case narrated.

#### EARLY DIAGNOSIS OF SCARLET FEVER.

At the present moment it is very important for medical men to be acute in the early detection of scarlet fever. Such acuteness is creditable from a scientific point of view, and it is valuable as giving timely information to friends which enables them to isolate the case early, and reduce to a minimum the number of things and persons brought into contact with the patient. For the purposes of this early diagnosis the throat symptoms are most important. The sore-throat of scarlet fever is very different from other forms of sore-throat, and it is one of the earliest available symptoms, being noticeable from the first day of the attack. The appearance is that of an erythematous redness, affecting the soft palate extensively, thus differing materially from the ordinary forms of tonsillitis, which affect the tonsils only in the first instance. As Trousseau says—whose description of scarlatina is worthy of serious study—“In scarlatina, from the first day of the attack, the veil of the palate has a red hue, analogous to, but deeper than, that of the skin.” When this condition of the throat is met with during an epidemic of scarlatina, with a very hot skin and a very quick pulse, accompanied with or preceded by vomiting, with a tongue with thick creamy fur, red borders, and prominent papillæ, the shrewd practitioner will be prepared for a case of scarlet fever. Dr. J. Lewis Smith, of New York, in his excellent work on the Diseases of Children, tells us, in his account of scarlet fever, that vomiting occurs in most cases within the first twenty-four hours, and has considerable diagnostic value. In 90 out of 117 cases which he carefully examined, he found vomiting to occur within the first twelve or eighteen hours. Of course when the eruption appears in addition to the above symptoms, the case is clear enough; but the practitioner who has carefully watched the group of facts which we have described will be as likely to discover the eruption for himself as to have it pointed out to him by others or by the patient.

#### THE WALLS OF THE UTERUS AFTER PREGNANCY.

THE difficulty of determining, from the state of the uterus alone, whether or not a woman has borne a child, was illustrated recently by the medical evidence given before the Lord Chief Justice at the trial of the brothers Wainwright. The difficulty in this case arose, not from the fact that the uterus was in a state of decomposition, but because no marks are left in the uterus which has once been gravid whereby the previous existence of such a condition can be established. At the same time, there are appearances which, when present in the womb, militate against the supposition that the organ has been gravid, though they do not exclude the possibility of such a condition having existed. One of these is unusual thinness of the uterine walls. In the great majority of women who have borne children the walls of the uterus remain permanently thicker than they were in the virgin state of the organ, for involution rarely takes place in such a degree as to reduce the womb to its original size. Yet cases do now and then occur in which the process goes on beyond its normal limits, and the uterus becomes reduced to a size considerably smaller than that of the virgin

womb; indeed, it may be reduced to such a size as to elude detection by the most careful vaginal examination.

Other marks which may be left on the uterus as the results of pregnancy and delivery, such as fissures of the cervix, thickening of the lips, changes in the shape of the external orifice, may also be produced by disease and its treatment, so that singly or together they are almost valueless for the determination of the existence of previous gravity. Some of the witnesses stated that it was not possible to form a positive opinion whether the woman had borne children or not. This accurately expresses our present knowledge of this question, and any further expression of opinion, however elicited, could only lead to conflicting evidence, such as that witnessed at the recent trial.

#### BURNS AND SCALDS.

DR. NITZSCHE, surgeon to several factories of Austria, stated at the Grätz Congress that he had noticed the workmen who met with burns obtaining much relief from the application of varnish. The latter forms a protective covering in the absence of epidermis, and granulation and cicatrization are favored. Dr. Nitzsche thought he could improve upon this, and tried to keep away Pasteur's germs by adding first carbolic acid, and subsequently salicylic acid, to the varnish. He considers that he thus succeeded in many cases in effecting prompt healing. These burns were probably in the third degree, with complete loss of epidermis. Another kind of burn where the epidermis is preserved, but much serum is secreted underneath, has fixed the attention of Dr. Marin, of Geneva. This physician grounds his treatment upon Dutrochet's law of exosmosis, and thinks that the diminution of the serum effused under the epidermis should be obtained without the destruction of the latter. This is effected by the application of thick fruit jellies, say of quince, raspberries, &c. Compresses of lint should be soaked in the jelly, so as to become considerably thickened. The serum transudes into the compress, and when after a day or two it is removed, the epidermis is found shrivelled up, and the parts beneath protected from inflammation and ulceration. Dr. Marin insists upon the rule that when pieces of clothing are adherent to the burned surface, they should not be removed, for fear of dragging the epidermis with them. The compress should be placed on the clothing material, and the exosmosis will eventually go on just as well. Dr. Marin quotes, in a pamphlet on the subject, several cases well calculated to recommend this kind of treatment, concerning which he is very enthusiastic. It is well known that a long time ago jams and syrups were used in France, *empirically*, in cases of burns. Louis XIV. having met with a burn on his hand, his valet de chambre plunged it immediately into a jar of jam with much relief.

#### AUDI ALTERAM PARTEM.

DR. METZQUER lately read two papers before the Academy of Medicine of Paris, wherein he strives to prove the non-inoculability of tubercular matter. "I have had the honor," says the author, "of

bringing before the Academy 81 experiments, which prove that, with non-tubercular matter, lesions may be produced identical with those excited by tubercular substance. 18 experiments prove that the nodules thus produced may become absorbed. These 44 experiments added to those of my first paper amount to 180 experiments, controlled by Messrs. Morel, Michel, and Feltz. I have shown that the nodules resulting from these inoculations may become absorbed, and really disappear in the majority of cases. I have proved that we can, at will, produce pulmonary or, speaking more generally, organic lesions, which have been erroneously looked upon as tubercular. To prove this, we need but inoculate solid matter of sufficient volume and easily reduced, either putrid or impregnated with putrid matter." The author then reviewed, critically, M. Villemin's experiments and the meaning he attaches to them. Finally, M. Metzquer said: "I maintain, after 180 experiments, that the nodules developed after the above-named inoculations have no analogy with tubercles, because—1st, they become absorbed in the majority of cases; 2nd, because they can be produced by the inoculation of different substances; 3rd, because, when experiments are undertaken with actual tubercular matter, no results are obtained except that matter be in an advanced stage of decomposition. The committee appointed to report upon these papers is exceptionally numerous, comprising Messrs. Villemin, Hérard, Colin, Henri Roger, T. Guérin, Hirtz, and Béhier. The first three are well known for their labors on this intricate question.

#### RESEARCHES ON THE MODE OF TERMINATION OF THE NERVES IN THE CONJUNCTIVA.

In a short paper devoted to this subject in the *Archives de Physiologie* M. Poncet observes that the branches which innervate the conjunctiva proceed from the infratrochlear, frontal, and lachrymal nerves, with a few branches from the ciliary ganglion. In 1859 Krause first published his researches on the terminal corpuscles of sensory nerves. His conclusions were accepted by Kölliker, Ludden, Rouget, Frey, and Ciaccio, but have been lately opposed by Waldeyer. Arnold was also unable to admit their accuracy. Krause found about eighty club-shaped terminal corpuscles in the interior of which the nerves ended. These corpuscles he named *End-Kolben*, or terminal bulbs. The terminal bulbs consist of an envelope of connective tissue, containing a semifluid granular material. One or two nerves, with doubly contoured outline, run to these, twine round them, and penetrate into their interior, where they give off one or two branches that appear as fine short pale fibrils, terminating by slight enlargements. M. Poncet criticises several points in M. Krause's description. In the first place, working with chloride of gold and osmic acid, which were not in use when Krause made his observations, he finds the nerves do not coil round the outside of the corpuscles before penetrating them; secondly, that all the sensory nerve-fibres do not terminate in such corpuscles as Krause supposed; thirdly, that the part of the conjunctiva in which they are most commonly found is the upper and outer segment. This part of the conjunctiva is endowed with exquisite sensibility.



## DEATH FROM CHLOROFORM.

A RECENT death from chloroform in the practice of Mr. Chesshire, one of the surgeons of the Birmingham Eye Hospital, presents some peculiar features. The patient was a gardener, forty-two years of age, who had received a gunshot wound in his right eye while beating for game on the 16th November. The safety of the other eye being endangered, Mr. Chesshire recommended extirpation of the affected eyeball. Forty or fifty drops of chloroform were administered on a towel, and the patient "immediately became semi-unconscious." The operation was commenced, but the patient not appearing to be sufficiently under the influence of chloroform, forty or fifty drops more were given. Mr. W. M. Jackson, of Smethwick, noticing a failure in the patient's pulse, at once seized him by the feet and lowered his head. He afterwards practised artificial respiration, but the man died in about half an hour from the time of the first administration of the chloroform. The patient had no disease of the heart, and was free from excitement prior to the operation. It is remarkable how small a quantity of chloroform proved fatal in this case; probably not more than two drachms were used altogether, and every precaution was taken in the administration of the drug, and yet death resulted.

## BORACIC ACID IN THE TREATMENT OF RINGWORM.

Surgeon-Major Watson reports in the *Indian Medical Gazette* that he has lately employed boracic acid with very great success as an external application in the treatment of the dermatophyta or vegetable parasitic diseases of the skin. He was induced to try this remedy from witnessing its employment as an antiseptic in the Edinburgh Infirmary wards. The diseases in which he has hitherto used boracic acid have been the different forms of tinea (T. tonsurans and circinata), and in that very troublesome form of the disease which affects the scrotum and inner side of the upper part of the thighs of many Europeans in India. Dr. Watson declares that the external application of a solution of boracic acid acts like a charm in such cases. An aqueous solution of boracic acid of a drachm to the ounce, or as much as the water will take up at ordinary temperatures, is employed. The affected parts should be well bathed with the solution twice daily, some little friction being used, and it should not be wiped off, but allowed to dry on the part. The remedy is said to be so simple, cheap, and efficacious, that it has only to be once used to be preferred to all other remedies of the same class.

## RESEARCHES ON MÆCONIUM.

ZWEIFEL (*Achiv fur Gynæcol.*, Band viii.) has recently investigated the contents of the large intestine in still-born children, and has made the interesting observation that they contain hæmatoidin-crystals, which present the characteristic reaction described by Gmelin—namely, that the chloroform extract when evaporated yields bilirubin crystals. The crystals of hæmatoidin and other morphological constituents of meconium are no longer discoverable in the yellow evacuations. The chemical constituents found in meconium are billiverdin, bilirubin, the biliary acids, cholesterin, mucin, traces of formic and other volatile as well as some

non-volatile fatty acids. No grape sugar, glycogen, paralbumen, leucin, tyrosin, albumin, peptone, nor lactic acid could be found. The amount of water in meconium was 80 per cent.; the ashes formed 1 per cent.; the fatty constituents 0.772 per cent.; and the cholesterin 0.797. Examination of the ashes showed, in contrast with the fæces of adults, a high proportion of sulphuric and a small proportion of phosphoric acid.

## DELIGATION OF THE CAROTID ARTERY FOR NEURALGIA OF THE FACE.

At the annual meeting of the doctors of Grätz, Dr. Patruban read a paper on this operation, in which he offered no theory as to the mode in which it acts, but grounded his defence of the operative measure on the results obtained. He proposes to operate in this manner when all other means have failed, and the patient insists upon relief at any cost. He himself had tied the carotid artery under these circumstances thirteen times, and had never noticed any of the symptoms mentioned as often occurring, such as cerebral congestion, vertigo, double vision, squinting, &c. The idea of the operator had been gained by the relief obtained, in some cases, by simple pressure of the carotid. The author added that no accidents need be feared if the operation is well done.

## TRICHINOSIS.

EPIDEMICS of trichinosis are not frequent, but those which occur and are recognised are so wide spread as to render it increasingly evident that the disease has obtained and maintains no limited foothold. From the east and the west news of its occurrence reaches us. In Germany, indeed, its existence seems to be well looked for, and a corresponding decrease in the disease may be expected. It is evident that its ravages have been already checked by careful scrutiny of pork. In the district of Brunswick, according to the report of Dr. Uhde, only twenty affected pigs were found out of a total examined of more than 100,000. Eighteen of these were, however, found in the city of Brunswick. But from America the account is less reassuring. We have received from Dr. Sutton, of Aurora, Indiana, an instructive account of a carefully investigated outbreak of the disease which occurred in that town in 1874, in which nine persons were attacked, three of whom died. The disease in each could be traced to the same cause; all had eaten of some uncooked smoked sausages made from the meat of a pig which was subsequently shown to be full of trichinæ. The symptoms were mainly those of gastro-enteritis; muscular pains were conspicuous in only a few instances. In one of the fatal cases, however, the muscular tenderness was so great that the patient could scarcely be moved, and persistent general oedema was very marked. In this case examination of the patient's muscle after death showed it to be so crammed with trichinæ that their numbers were estimated at 100,000 in every cubic inch. In the other two fatal cases, although the circumstances of outbreak and symptoms were the same, scarcely any trichinæ were found in the muscles,

the post-mortem appearances being those of gastro-enteritis. One or two trichinæ were found in the intestinal wall. In the first case the general oedema and muscular tenderness occurred in ten days from the onset of the gastric symptoms, and as a week is considered necessary for the development of the young trichinæ in the alimentary canal, their diffusion into the system must have been effected with great rapidity.

The resemblance of the symptoms in two of the fatal cases, and in those which were not fatal, to a simple inflammation of the alimentary tract, is a fact of much importance, which was further confirmed by experiments on dogs. Its importance lies in the fact that while trichinosis had no place in the Registrar-General's returns in America a few years ago, dysenteric and enteric affections produce a great number of deaths, and Dr. Sutton brings forward facts to show that a considerable proportion of the pigs killed in the Western States are affected with the disease. Microscopic examination of the flesh of several thousand pigs killed in South-eastern Indiana showed that from 3 to 16 per cent. were effected with the disease. The Western States are the chief pork-producing districts. It is estimated that in them five million pigs are killed and sent away each winter, their flesh being the chief animal food of a large portion of the population of the United States. If only 4 per cent. of these pigs are diseased the number of affected animals annually sent to the American market is upwards of two hundred thousand! If it be true that in 90 per cent. of the cases of trichinosis the chief symptoms are intestinal, trichinosis may have been effecting serious unsuspected ravages for many years.

With reference to the alleged identity of "hog cholera" and trichinosis, careful examination of the flesh of six animals dead of the former disease failed to show the slightest evidence of trichinæ, and the two diseases are therefore regarded by Dr. Sutton as distinct. Three out of four cats fed on diseased meat were found to be swarming with trichinæ; in none of forty-two rats and of eight moles examined could any trichinæ be found.

## News Items, Medical Facts, &c.

**ULCERATED NIPPLES.**—M. Legroux (*Annales de Gynécologie*, Nov. 1875) advises the following treatment:—Spread with a camel-hair brush a layer of elastic collodion around the nipple, in a radius of an inch or more; a piece of gold-beater's skin should then be placed over the nipple and collodion, taking care to make a few holes with a pin over the part of the gold-beater's skin which covers the nipple, so as to allow the milk to ooze through. No collodion should be spread on the nipple itself, as some pain might thereby be occasioned. By the rapid evaporation of the ether the collodion dries up, and the gold-beater's skin adheres. The nipple is then more or less pressed down by the latter, which in drying becomes tense. When the child is to be nursed, the end of the nipple should be wetted with a little water. The gold-beater's skin which covers it becomes soft and supple, allows the nipple to swell, and protects the ulcers and fissures from the strain of suction. The mother or wet-nurse thus suffers no pain, and the ulcers heal in a few days.

We gather from a paper read before the New York Medical Society by Dr. Fordyce Baker, whose name is familiar enough in this country, that the surgical wards

of the Bellevue Hospital in New York were recently thoroughly disinfected by chlorine gas and ozone, the process of purification being conducted on a most extensive scale. For generating the chlorine five thousand pounds of the black oxide of manganese, twenty-five sacks of salt, and one hundred and sixty pounds of sulphuric acid were used, while the requisite amount of ozone was obtained by the employment of one hundred pounds of manganate of soda and the same quantity of sulphate of magnesia. The result of this cleansing was markedly beneficial. The fatality from septic diseases had previously been alarmingly great in the wards, while but one case of pyæmia, and that a very doubtful one, has occurred since the disinfection of what Dr. Fordyce Barker calls "nosocomial malaria."

**MARE'S MILK.**—The composition of asses' milk, though deficient in fat by 2 per cent., has always been considered the nearest to that of woman's milk. From Langgaard's analysis in Virchow's Archiv (lxv., i.) there seems to be a considerable difference in the casein of the cow's and of the mare's milk. The former is nearly insoluble in water; the latter, especially when in the fresh state, much more so, though not in an equal degree to woman's milk. The chemical reaction on different kinds of acids also shows the casein of mare's milk to be more like that of the human female. Trials of artificial digestion proved both much more digestible than cow's casein. Though the use of mare's milk for infants may be connected with difficulties, the superiority of koumiss made of it over the preparation from cow's milk seems to be pretty clearly demonstrated by the different characters of the two kinds of casein.

**THE MEETING OF CORPULENT MEN IN AMERICA.**—The papers of the United States give a description of this meeting, which took place at Gregory's Point on the 25th of August last. If the details are not a little exaggerated, monstrous individuals to the number of about one hundred assembled together, some being brought in carts, as no ordinary vehicle would carry them. The consumption of food at the dinner was, it is said, "miraculous." 100 barrels of oysters, 10 casks of potatoes, 300 lb. of carps, 100 lb. of eels, 300 lb. of lobsters, besides mountains of meat of various kinds. The beverage was beer, of which 300 barrels were drunk. Would not these people be highly benefited by a course of "Banting"?

**INCONTINENCE OF URINE IN CHILDREN.**—Dr. Ultzmann thinks that the chief cause of incontinence of urine in children lies in the weak state of the sphincter, through which circumstance the detrusor acquires unusual power. He advocates the induced current. A small brass plug is to be placed in the rectum, and one of the poles connected with it, whilst the other may be placed over the symphysis pubis or the upper part of the thigh. The sittings should last from five to ten minutes. Dr. Ultzmann mentions nine cases, in some of which he met with success. The use of belladonna remains, however, of great importance in these cases.

**THE Pharmaceutical Journal** publishes a short paper by Dr. De Vrij, of the Hague, on "East India Chin-chona Bark." The writer calls attention to the quantity of alkaloids which can be extracted from any variety of bark by water only. By percolating one part of finely-powdered Indian red bark with cold water until eight parts of clear fluid were collected, he obtained by precipitation with an excess of caustic soda three-eighths of the total amount of the alkaloids contained in the bark. Dr. De Vrij is engaged in prosecuting further experiments in this direction.

The encouraging results that have followed the method of treatment of leprosy by gurjun oil, seem to be attracting attention. We learn from the *Madras Mail* that a piece of ground has been given by the Directors of the Monegar Choultry to the superintendent of a lazaretto on the recommendation of the Deputy Inspector-General of Hospitals, who intends erecting sheds for patients to enable him to experiment with the gurjun oil on a large scale.

PRINTED AND PUBLISHED BY

WM. C. HERALD, No 53 JOHN ST., NEW YORK.

# THE LANCET.

A Journal of British and Foreign Medicine, Physiology, Surgery,  
Chemistry, Criticism, Literature, and News.

JAMES G. WAKLEY, M.D., M.R.C.S., EDITOR.

PUBLISHED MONTHLY.

No. 3.

NEW YORK, MARCH, 1876.

## A Clinical Lecture

ON

### THE PULSE: ITS DIAGNOSTIC, PROGNOSTIC, AND THERA- PEUTIC INDICATIONS.

Being Lecture III. delivered at St. Mary's  
Hospital in the Summer Session of 1875,

By W. H. BROADBENT, M.D., F.R.C.P.,

Physician to the Hospital.

GENTLEMEN,—I come now to Renal Disease as a cause of high arterial tension. This condition is most marked in connexion with contracted granular kidney, but is present in a greater or less degree in all affections of the kidneys, except, perhaps, in amyloid disease, when, unless there is desquamative nephritis as a complication, or general arterial degeneration, the tension may not be great. In tubercular or scrofulous disease of the kidneys there appear to be differences; for I have sometimes found the arterial tension high, sometimes not.

It is with respect to the state of the vessels in contracted granular disease of the kidneys that there has been a controversy between Dr. George Johnson and Sir Wm. Gull and Dr. Sutton. Dr. Johnson, in his original investigations which first gave us precise knowledge of the different forms of kidney disease, noted the thickening of the minute arteries of the kidney in this affection. More recently he found that not only were the branches of the renal artery thickened, but that a similar condition of the minute arteries existed throughout the body—in the meninges of the brain, in the skin, in the gastro-intestinal mucous membrane, and elsewhere; he found, moreover, that the thickening consisted primarily and chiefly of hypertrophy of the muscular coat. These were no barren discoveries in his hands, but became the basis of a theory which linked together by a consistent physiological or pathological explanation the previously isolated phenomena of this form of

disease. According to this the kidneys, from gradual loss of the secreting epithelium, fail to remove effectually the urinary constituents, leaving the blood contaminated thereby. The arterioles, to protect the tissues from blood thus rendered impure, resist its passage by contracting, while the heart, meeting with unwonted resistance, puts forth increasing energy; and the result of this contest between the heart, on the one hand, and the minute arteries, on the other, is hypertrophy of the muscular tissues of both.

My way of describing the mode of causation of this hypertrophy is a very imperfect representation of Dr. Johnson's views, and is open to objection on various grounds, as involving unproven theory, and as teleological, assuming that a process *is* because it is useful, or that a process is useful because it *is*; but I have had to sacrifice exactness of expression and completeness of exposition to brevity. It seems, again, a *reductio ad absurdum* to represent the heart and arteries as engaged in this contest, which is damaging to both alike, in the interests of the system generally; but the high arterial tension thus generated, though ultimately tending to shorten life, is, after all, conservative, for by increasing the flow of urine and producing the diuresis which accompanies this disease it postpones the catastrophe of uræmia which would otherwise speedily overtake the patient.

The rival theory of Sir W. Gull has a clinical basis. At a certain time of life it is very common for men to begin gradually to lose flesh, color, and strength; they suffer from indigestion, the appetite fails, and the bowels act sluggishly; they become apathetic or irritable, disinclined for exertion and incapable of it; the muscles waste; the skin is thin, loose, and dry; some remains of color persist perhaps in the cheeks from enlarged capillaries, but the temples and the rest of the face acquire a somewhat sallow hue, and the lower eyelids are more or less puffy; often the mucous membrane of the mouth is more anæmic than might be expected from the color of the face, and there is a deficiency of buccal fluid and a slightly furred tongue. All this time the urine is abundant and clear—perhaps a subject of self-gratulation to the patient; but it will be pale and have a low specific gravity; there may for a long time be no albumen in it, or a trace may come and go from time to time, but eventually albumen is habitually present,

and the case resolves itself into well-characterised Bright's disease.

Sir W. Gull and Dr. Sutton, like Dr. Johnson, find in a case of this kind the arterioles thickened, but, say they, the thickening is not hypertrophy, but degeneration. The change in the arterioles they describe as hyaline-fibroid, the disease they name arterio-capillary fibrosis, and the sequence of events they consider to be primarily arterio-capillary degeneration, and secondarily a general fibroid change, in which the kidneys share, so that the kidney disease is not the cause, but the consequence, of the condition of the vessels.

Now of the truth of this clinical history, with the comparatively late appearance of albuminuria in many cases of chronic Bright's disease, there can be no doubt; but I agree with Dr. Johnson in disputing the inference drawn from it. First as to the fundamental fact—the nature of the change in the arterial walls as revealed by the microscope after death: is it hypertrophy, or is it degeneration? On the one hand, Dr. Johnson shows an increase in number, size, and distinctness of the nuclei of the muscular fibre-cells, which cannot be mistaken for anything else, and cannot be manufactured by any mode of preparation; on the other, he shows that the swollen, translucent, structureless, or finely fibrillar appearance which Sir W. Gull and Dr. Sutton exhibit as hyaline-fibroid degeneration is, to say the least, producible by the methods of preparation they adopted, and is probably the result of obliteration of the structural characters of the arterial coats. We are asked to suspend our judgment pending the production of further evidence; but I do not see how the unequivocal demonstration of increased muscular tissue can be explained away. With the muscular tissue there will also inevitably be increase of fibrous tissue, which may swell up and obscure the muscular fibres under the use of certain reagents; but this does not prevent the hypertrophy of muscular structure from being real.

But the question does not rest simply on microscopic evidence. If the change in the arterioles were degenerative, the usual physiological and pathological contraction and relaxation of their muscular fibres could not possibly occur, and there could be no changes in the diameter of the vessels or variations of the arterial tension so caused. Now it is certain that the arterial tension is subject to modifications even in advanced Bright's disease. My attention was first forcibly called to this fact in an interesting case which was the subject of a clinical lecture in the winter session of 1871-72. The patient was a woman, six months pregnant, under treatment for albuminuria, who died shortly afterwards of apoplexy, and was found to have contracted granular disease of the kidneys. She presented the phenomena of extreme arterial tension, and I was in the habit of demonstrating in her case the characters of the pulse attending this condition. One day, after telling my class as we approached the bed what to expect, I found, on placing my hand on the wrist, that all the indications of high tension had vanished. This was because she was suffering from a smart attack of pyrexia, with the subsidence of which the tension returned, ultimately, as I said, proving fatal by giving rise to apoplexy. I have repeatedly made similar observations since, and when the subject of arterio-capillary fibrosis was coming on for discussion at the Medico-Chirurgical Society,

these cases suggested to me an experiment which was entirely confirmatory. This was to administer nitrite of amyl in a case of well-marked chronic Bright's disease, and note the effects on the pulse. Pulse tracings taken before and after the inhalation demonstrated unequivocally the relaxation of the arterioles.

The truth is, or, I ought rather to say, my firm conviction is, that the clinical history, traced by Sir William Gull as that of arterio-capillary fibrosis, which I have just imperfectly reproduced, is a history, not of arterial degeneration, but of arterial tension. From the first the pulse is small, long, and hard, and the cardiac signs of arterial tension first interpreted by Dr. Sibson are present; the first sound is reduplicated over the interventricular septum, and at the right second space the first sound is muffled, the second (aortic) intensified or accentuated. But the abnormal state of the circulation can be reversed, and that not only by pyrexia, but by treatment. Allowed to continue long enough, it may give rise to arterial degeneration, and this degeneration becomes the great source of danger, but the degeneration is not primary, and can be prevented. One of the cases I related in my last lecture is a typical illustration of the clinical history under consideration.

The kidney disease, then, is not a result of vascular degeneration. But there is another point to be considered—is it the result of arterial tension? The arterial tension is antecedent in point of time to the renal disease. Does it stand in a causal relation to it? or are the two conditions—the arterial tension and the structural change in the kidneys—concomitant results of a common cause? The interesting facts adduced by Dr. Mahomed in his paper on the pre-albuminuric stage of acute Bright's disease—that after scarlet fever there is, with rising intravascular pressure, first escape of blood-crystalloids, and then of blood-albumen—would seem to point in the direction of a causal relation between the two; but I have come to the conclusion that an impure state of the blood is the cause both of the resistance in the capillaries and arterioles which gives rise to high arterial tension, and of the morbid change in the kidneys.

A subordinate question is whether the resistance to the circulation of contaminated blood is primarily in the capillaries or arterioles—whether, that is, there is first obstruction in the capillaries, the contraction of the arterioles being secondary, or whether the narrowing of the minute arteries is the sole cause of the obstruction. Of course this brings up the entire subject of the capillary circulation, how far the mutual attraction of the blood and tissues operates to facilitate or hinder the passage of the blood, and this is not to be discussed within the limits of a clinical lecture; but I may say that I have come to believe that, while as a rule the action of the arterioles is direct, and not merely secondary to resistance in the capillaries, there are cases in which the resistance is capillary, the arteries yielding to the pressure of the blood within them.

I shall not occupy you long by illustrations of the association of high arterial tension with disease of the kidneys. The subject is one which I have considered here before, but it is strictly within the scope of this lecture to refer to cases in which the pulse has at once given the clue to the kidney disease. Most of you will remember the case I have already mentioned of a man, Henry C—, aged

thirty-three, who applied for admission suffering from pain in the head, vomiting, and impairment of vision; he reeled and staggered also, exactly like a drunken man, and could not walk without support; his speech, again, was thick. He presented a complete picture of cerebellar disease. I sent him to the ward at once, with the remark that there was apparently disease of the cerebellum, probably, from his age and appearance, syphilitic, postponing examination till we could go into the case fully. When I came to his bedside, however, expecting the symptoms and history of an intracranial affection, I had scarcely placed my hand upon the pulse when my first-sight diagnosis fell to the ground. I saw I had to deal with renal disease; the urine was examined and found to be albuminous, the ophthalmoscope showed us albuminuric retinitis, instead of optic neuritis or ischæmia; the headache, the vomiting, the loss of vision were uræmic, and ultimately we had post-mortem demonstration of contracted granular kidneys.

In November, 1873, a former student of this hospital, one of our very best men, sent a clergyman to consult me on account of headache, attacks of giddiness, and impaired sight. Prepossessed with the idea of cerebral mischief, he had overlooked the contingency of renal disease, and had never examined the urine. Here, again, the pulse, long and hard, the artery standing out among the surrounding structures, at once suggested the diagnosis of kidney disease, which was confirmed by the presence of retinal hæmorrhages, a clouded disc, and the familiar white spots round the disc and yellow spot. The diagnosis thus made was verified by the state of the urine, in which, however, at this time there was the merest trace of albumen. Later the symptoms of Bright's disease became more marked, obstinate vomiting being prominent among them, and the patient died a short time ago.

I am reminded of another case in which I was called in consultation to a case of periodic vomiting in an old lady. Her pulse, small and weak, but with all the characters of tension, suggested an examination of the urine, which, as I had anticipated, was found to be albuminous. The vomiting was uræmic.

The examination of the urine is almost a matter of routine, but in both these cases it happened to be omitted. You are aware, however, that albumen is not always present in the urine in contracted granular disease of the kidneys; in the early stages it comes and goes, and later may occasionally disappear. You will see, therefore, the importance of having so clear an indication in the state of the pulse.

*Gout and allied conditions of system as a cause of arterial tension.*—The term "suppressed gout" is a convenient refuge for ignorance and uncertainty; it is accepted by the public as a sufficient explanation of any chronic or recurrent ailment, or, indeed, of anything and everything, and accordingly it is freely used by medical men. The expression, often spoken of contemptuously, has, however, considerable vitality, because it carries a certain amount of truth. Originally it embodied a conclusion formed from profound clinical observation, and, if it were not abused by indiscriminate application to all kinds of complaints, would be very useful and valuable. In gout, as you are aware, the oxidation of nitro-

genised waste, instead of going on to the formation of urea, has stopped short at uric acid, which accumulates in the blood and constitutes a poison to which the attacks of gouty inflammation are due. This, at any rate, is the theory which, if not demonstrably true in every point, is an excellent working hypothesis. But the destructive metamorphosis may fall short even of uric acid, and the blood may be contaminated by a variety of imperfectly oxidised matters. The presence of these impurities in the blood gives rise to the most varied consequences: frank acute gout, chronic gout with the formation of gouty concretions in the joints, on the ears, in the conjunctiva; the less honest forms of gout, pains in the toe, the heel, the lofts, the head; attacks of vertigo, irritability of temper, loss of the faculty of attention, palpitation of the heart, cough and shortness of breath, dyspepsia, gravel or stone, inflammation or irritability of the bladder, eczema, and other skin affections. Besides these there are the so-called attacks of gout in the stomach or head, and sudden and extensive congestion of the lungs. After this list you will no longer wonder that everything is referred to suppressed gout. There is one feature, however, common to the whole range of these affections—high arterial tension. Nitrogenised waste, at whatever stage of arrested oxidation, appears to provoke resistance to the passage of the blood through the capillaries and minute arteries, and this affords us the clue which guides us through the maze and gives precision to our ideas.

We are now dealing, as you will see, with the main cause of the two serious forms of disease we have already considered—degeneration of arteries and chronic granular contraction of the kidneys; and what makes it more important is, that at this stage we have the opportunity, not for palliative only, but for remedial treatment. The arterial degeneration is a direct result of the strain upon the walls of the vessels by excessively high tension. As to the renal disease, we cannot, as I have already said, speak so positively; we cannot say definitely whether it is produced by the state of the blood acting injuriously on the epithelium of the tubules, or whether it also is a consequence of high arterial tension.

The following are some of the cases I have seen which may serve to illustrate different phases and stages of suppressed or spurious gout.

I was called in March, 1873, to see a gentleman aged about sixty-four, who was suffering from cough. He held a high position in the Colonial Service, and had spent a great part of his life in hot climates. He was supposed, on that account, to be susceptible to cold. He was stout, good-looking, and of very dignified appearance, but singularly stolid, dull, and uncommunicative. I permitted myself, indeed, to make certain mental reflections on the kind of King Log sent out to administer our colonies. His symptoms, however, were not fully accounted for by the slight bronchial catarrh which was all I found on examination of the chest. More particularly my attention was arrested by a high degree of arterial tension, shown by the long, hard, laboring pulse of 84, and by the vessel remaining full between the beats. There were also the cardiac signs of high tension, a reduplicated first sound near the apex, and an accentuated aortic second sound. By pushing my inquiries, I gradually learnt that my patient had for some little time been more easily fatigued than

usual, had been often greatly flushed after dinner, unaccountably irascible, with lapses of memory at times, and, finally, it came out that in a letter written shortly before my visit there had been the most extraordinary anomalies of spelling, many words having been spelt backwards. Nothing could have been more significant than this train of symptoms associated with arterial tension; they were the premonitions of impending apoplexy; and apoplexy, as I learnt later, was the natural mode of death in his family at about his age. The urine had a specific gravity of 1014, but had a good deep color, and contained no albumen. The object to be attained, in order to escape the threatened danger, was to bring down the arterial tension. I gave calomel (three grains), with colocyath and colchicum, followed by a saline draught as a purgative, and iodide and citrate of potash with taraxacum; reduced the proportion of meat in the diet, substituting milk and fish, and for a time made dinner a midday meal; no restrictions were needed with regard to stimulants, the patient's habits being almost abstemious. This line of treatment was continued for some little time with the effect of removing all the unpleasant symptoms, and I found I had done my patient's mental power and social qualifications great injustice. I saw little of him till Feb., 1874, when I was urgently called one evening, and found that, after similar warnings, he had partially lost power in his left limbs; the left side of the face was slightly paralysed, and the speech very thick and indistinct; there had been some mental confusion, but no loss of consciousness. A similar line of treatment was adopted, and now the dinner hour was permanently established at 2 p.m. Improvement again followed, but it was long before the face recovered itself, and, indeed, a slight inequality is still to be detected. In Feb., 1875, my patient lost all appetite, and the tongue was much furred; there was a certain degree of tension in the pulse, but not so much in my judgment at the time as to warrant the free purgation I had previously employed. I gave aperients and bitter tonics without much effect. My patient fasted strictly through Lent, and lost considerably in weight. After Easter I was asked to see him on account of slight bronchial catarrh. While recovering from this he was seized with severe influenza; and just as he seemed to have shaken off this, and before he left his bedroom, a sudden and violent attack of congestion of the lungs supervened, which nearly proved fatal within twenty-four hours. My treatment of the last complication was dictated by my previous knowledge of the case, and was of a kind I should not have ventured to adopt without it. The congestion of the lungs was simply another consequence of the blood-contamination, of which the arterial tension had formerly afforded evidence; but the tension had lately been less manifest in consequence of weakness—had, in fact, been disguised. Recognising this, I resorted as before to very free purgation, and relief came when this was obtained. Here we reach one of the most interesting points in the case. The convalescence was not satisfactory; the temperature subsided, there was free and loose expectoration of rusty muco-purulent matter, but the appetite did not return, the tongue did not clean, the pulse was weak but long, and there was no recovery of strength till one day there was pain in the ball of the great toe. A mustard poultice was applied, and the pa-

tient had his first attack of gout, which was perfectly characteristic, and, considering the circumstances, remarkably severe. After this he was well almost at once, and remains well up to the present time. Here residence in a hot climate, a vegetable diet, and abstinence from the heavier wines, had prevented the full development of gout in a constitution strongly predisposed by hereditary tendency; but a return to this country and to English habits of life, the consumption of more animal food, and the diminished cutaneous excretion, had speedily led to the accumulation in the blood of imperfectly oxidised nitrogenised waste and its consequences. The truth of the inferences I had drawn as to the danger arising from the arterial tension, and as to the cause of this tension, was fully established by the course of events. The occurrence of a first attack of gout after the treatment pursued was remarkable, and indicated, in my opinion, that the metamorphosis of nitrogenised matter had stopped short of the formation of uric acid.

I have had another interesting case under observation recently, which I may briefly relate. A medical man in the country returned home one day last April, about 2 p.m., from an unusually long and cold ride. He took some soup and a glass of sherry, and found, as he thought, that the wine got into his head, for he felt giddy and had to lie down; his speech was thick; he was violently sick; and it was some little time before he could proceed to the remainder of his day's work; and when he tried to walk it was noticed that his left limbs had lost power in some degree; they felt numb, also, at first, and later were in a state of hyperæsthesia. One medical friend said it was "biliousness"; another thought more seriously of his condition, and he came to town to consult me a week after the attack. He was the youngest of a healthy family of sixteen—healthy, that is, except as to a strong gouty tendency. He had a large country practice, was of active habits, worked very hard, was abstemious both as to food and alcoholic drinks; but notwithstanding this he had become decidedly stout, and had from time to time had gouty symptoms. The vertigo and sickness might, of course, have been due to gastric or hepatic derangement, had they been the only symptoms; but the loss of power and sensibility and subsequent hyperæsthesia, and the thickness of speech, remains of which existed when I saw him, were significant of some cerebral mischief; and the pulse gave evidence of very high arterial tension, being hard, long, and rather small. Here, rest from worry, mercurial purgatives, potash salts, a farinaceous and fish diet, with weak spirit-and-water, or water only, as drink, have resulted in an effectual lowering of the vascular tension, loss of redundant fat, and removal of the symptoms. A too rigorous application of the principles laid down, indeed, led to attacks of giddiness from imperfect supply of blood to the brain; and I found it necessary to recommend citrate of quinine and iron for a time, with iodide of potassium.

In the following case, I have no special reason for saying that there was gout, but the patient was, I believe, on the verge of apoplexy. He was seventy-seven years of age, but remarkably hale and vigorous, and would have passed well for sixty. He had been suffering for six weeks from sleeplessness and a feeling of extreme restlessness; naturally, also, he felt weak and worn in conse-

quence. Tonics had been prescribed, but had not suited him; and he had taken chloral and bromide of potassium, obtaining by their means an occasional night's rest, but no efficient relief. His appetite was good and the bowels regular—indeed he rather prided himself on his management of the bowels; he complained a little, however, of indigestion. I found in the pulse evidences of an extraordinary degree of tension, together with senile change in the vessels, though less than might have been expected; the artery large, cord-like, slightly uneven, firm, capable of being rolled under the fingers, and it could be followed half-way up the forearm, the pulsation being long and strong. Nothing could be more full of danger than this condition at the time of life. I gave, therefore, purgatives more freely than usual. After three or four doses the evacuations became so frequent and free that I feared I had carried the treatment too far. I found, however, that they were not liquid, but simply extremely copious, soft, dark stools; there had evidently been great fecal accumulation, notwithstanding my patient's assiduity in his attention to his bowels. It was some little time before his system regained its equilibrium; but the tension was quickly reduced, and the restlessness passed off. I attributed the sleeplessness to the high blood-pressure, which overcame the tonic contraction of the cerebral arteries, by which the anæmic condition of the brain essential to sleep is secured. Persistence of this degree of pressure must, I think, have resulted in rupture.

But apoplexy is not the only danger to which the arterial tension of retained nitrogenised waste gives rise. The heart may cease to be equal to the struggle against the increased resistance and become dilated, especially if there be degeneration of its structure. You know the usual consequences of this condition: breathlessness on exertion, then cough, with paroxysmal and habitual dyspnoea, œdema, general dropsy and all its miseries. In an early stage, with shortness of breath and cough, it is not uncommon for dyspnoea to come on at 3 or 4 A.M., compelling the patient to sit up, and perhaps pass the remainder of the night in this position. This speedily leads up to further symptoms; but when it depends on arterial tension, as is often the case, it may be relieved by treatment which removes this condition. I have now under observation a gentleman, aged seventy-eight, who, notwithstanding his years, is gradually recovering (has now, September, quite recovered) from severe nocturnal dyspnoea. He is crippled by chronic gout, has a well-characterised senile pulse, and a weak heart. The treatment has been a free resort to aperients and a cautious administration of digitalis and iron. In the case of a lady aged sixty-four, first seen in January of this year, who suffered greatly from this form of dyspnoea, together with harassing cough, complete relief was afforded by the removal of arterial tension by similar means. These cases are worthy of relation in detail had I the time, and I have notes of many others equally worthy of your attention: one, for example, in which I have in the course of six or eight years watched the gradual development of disease of the aortic valves under the influence of strain from arterial tension in a gentleman, the subject of gout. In another case, sent to me from the country in May, the patient had suddenly become liable to dyspnoea, attended with lividity of face on the slightest exertion; the mode of life and clinical

history having been exactly that of imperfect nitrogenised elimination and arterial tension. This gentleman had been seriously injured by Bantingism. I can only mention these few illustrations; but I may put in a few words the lesson to be learnt from them. It is, that when the heart shows signs of weakness, and especially when there is reason to believe that there is dilatation of its cavities and degeneration of its muscular walls, if there is any degree of arterial tension, the most effectual relief you can afford is to diminish the peripheral resistance. This can best be done by aperients, and by none so well as by pills containing one or other of the mercurial preparations; afterwards iodide and citrate of potash, or iron and digitalis, or tonics may be given. There is often a degree of debility which seems to contra-indicate purgatives altogether; but it will be found that the powers are oppressed rather than depressed, and that the weakness is apparent rather than real. Tonics in these cases only do harm until after the action of purgatives and other eliminants, when also digitalis may find its opportunity; but frequently, when you cannot strengthen the weak heart, you can give it less to do, and so make it equal to its work.

I proceed to illustrate other effects of retained nitrogenised effete matters with peripheral resistance to the circulation and high arterial tension.

A barrister, thirty-five years of age, consulted me in November, 1874. He was beginning to succeed in his profession, but his prospects were threatened by his state of health. After any heavy work, or an appearance in Court, he had palpitation of the heart and throbbing in the neck and head, with a feeling as if he were about to faint, rendering it necessary to take some stimulant; he would also be entirely sleepless at night. This had been attributed to weakness, and he had been taking meat three times a day rather largely at each meal, with a liberal allowance of sherry. Notwithstanding this his symptoms increased upon him. His appetite was good, his bowels regular, but the tongue was white and indented. I found the pulse full, long, and hard, and the aortic second sound unduly loud, and took these as my indications for treatment. I gave him a gentle aperient pill for four nights in succession, and afterwards every second night. In addition, I ordered phosphate and carbonate of soda, with tincture of ginger in infusion of calumba, and revolutionised his diet, allowing meat and wine (claret) only once a day; breakfast and lunch to consist of milk and farinaceous food. He got well at once.

In the last case there were no specially gouty family antecedents, and the choking of the blood with nitrogenised waste was a direct result of the mode of life. When there is hereditary tendency to gout, imperfect metamorphosis and elimination of nitrogenised matters occur much more readily, and sedentary habits, without any mistaken system of diet, or very moderate indulgence in beer or the stronger wines, with a liberal, but not excessive, amount of flesh meat, will, in spite of any active out-door life, result in the development of a gouty or pseudo-gouty state of system. I have been astonished to see how early in life arterial tension is met with in the children of a gouty parent. I have found it well marked at twenty-one, and seen prominent and tortuous temporal arteries at twenty-four, associated with unaccountable feelings of weakness, weariness, and depression, headaches,



loss of application and of interest in the ordinary pursuits and enjoyment of life, and other like symptoms. I will not give these cases in detail, but, instead of them, the following, which illustrates the same point.

A young surgical friend, about thirty-two years of age, consulted me on account of lassitude, inaptitude for work, loss of energy, headache, and other vague symptoms. I gave him the advice we always give each other—that is, to take a holiday. He took one, and was better. By-and-by he came back again with the same story, and he was now uneasy about his heart and lungs, had morning cough, and was sooner out of breath than usual. He could not always be going away on holiday, and I went more carefully into his case. He was remarkably strong physically, but had not quite the color he ought to have had, took less exercise perhaps than formerly, but still played cricket. His appetite was good and bowels regular. There was nothing particularly wrong that I could see till I placed my fingers on the pulse, when I found a largish cord-like artery standing out among the other structures, and traceable far up the forearm, the pulsation of course long. It instantly flashed upon me that his father was the subject of old-standing gout; the cause of his ailments was clear, fortunately the cure also. I recommended the treatment with which you must now be sufficiently familiar, and forbade my young friend his beer. In a week his arterial tension was reduced, and the symptoms were gone. Upon my happening to remark that beer would at once send up the tension again he volunteered with great alacrity to make the experiment, but to this I did not give my sanction, and he confesses that he is amply compensated by his improved health for the sacrifice I imposed upon him.

It is time now that I should say something more definite of the treatment you have seen me so often recommend, and give my reasons for adopting it. The aperient pills are sometimes the ordinary calomel and colocynth, or blue pill and colocynth or rhubarb pills, with perhaps hyoscyamus; sometimes colchicum or ipecacuanha is added. One or two pills will be taken nightly for two, three, or four consecutive nights, or on alternate nights, or twice a week, followed in the morning by a saline draught—sulphate or phosphate of soda, a Seidlitz powder, a dose of some aperient mineral water or of white mixture. The strength of the purgative and the frequency of its repetition will depend on the urgency of the symptoms, the degree of constipation, and many other circumstances. At the same time, I have generally given a mixture containing potash salts; the iodide, two to five grains; and citrate, fifteen to twenty-five grains, with spirit of ammonia and some vegetable bitter, as taraxacum, calumba, hop, gentian, or the like; or, instead of potash, soda salts, the carbonate or phosphate in a similar vehicle. The object in view is the reduction of the arterial tension, and this is effected to some extent by purgation as such, which withdraws a certain amount of fluid from the blood, and relaxes the vascular system of the gastro-intestinal mucous membrane. But while any purgative will do so much, the effect will be imperfect and temporary unless the nitrogenised waste, which is the cause of the obstruction in the capillaries and arterioles, is eliminated. Now the liver is the great organ and instrument of metamorphosis; urea and uric acid are believed to be

formed here, and on the efficiency of its functional action certainly depends the due elimination in the urine of the products of the disintegration of nitrogenised compounds. Mercury has long been supposed to act specially on the liver, and though experiments on animals have appeared to negative this idea, it is matter of observation that mercurial purgatives bring away darker and more bilious stools; it is also matter of observation that they produce a more marked and lasting effect on undue tension in the arterial circulation. I was taught as a student that other purgatives would do all the good which could be obtained from blue-pill and calomel without the risks said to attend the administration of mercury, and for a long time I was altogether sceptical when people who called themselves bilious insisted on the superiority of their favorite blue-pill. After a time, however, I was compelled to admit that the mercurial purgatives afforded a relief which no others did, but I only understood it when I began to observe that they had a greater effect on arterial tension. At present we must take our stand simply on the clinical fact that purgatives containing some preparation of mercury have this effect of lowering arterial tension. The explanation—namely, that this is produced through the influence of the metal on the liver conducing to a more perfect metamorphosis of nitrogenised matters—we hold less firmly. We may, if we prefer it, trace the good results to removal of bile from the upper part of the small intestine, which would otherwise have been resorbed and again separated from the portal blood by the liver. The potash salts are given as eliminants, their effects in this respect having been abundantly demonstrated. Diet is of the greatest importance. Meat should be consumed sparingly, its place in supplying nitrogenised food being to a great extent taken by milk and fish. Soups are forbidden. Little alcohol should be taken, and only in the form of the light wines or freely diluted spirit. Water, free from lime salts, should be drunk in large amount.

We have by no means exhausted the subject of gout, pseudo-gout, suppressed gout, and allied conditions. I have mentioned lead poisoning as a cause of arterial tension—it is in effect a cause of real subacute or chronic gout, with all its attendant evils: chalk-stones, deformity of the hands and feet, contracted granular kidney, heart disease, arterial tension and degeneration of the large and small blood-vessels, apoplexy, &c. It is of course among hospital patients, painters, and other workers in lead, that gout from lead-poisoning is met with, and they have furnished some of the most terrible examples of gouty disease I have met with. There is a "gout pill" which these artisan classes obtain from chemists, which appears to be most effectual in suppressing gouty paroxysms and pain; there is not, therefore, the check on habits tending to produce gout which the paroxysms would impose, while the poison, never eliminated or destroyed by attacks of acute gout, accumulates in the system in an extraordinary degree. I have seen several cases of gangrene of the lungs in individuals saturated in this way with gout, and believe the lung affection to have been due to this condition of system, in which there is apparently a tendency to thrombosis in the pulmonary vessels. It is interesting and suggestive to note that in the case of gangrene of the lungs recently under my care in the hospital we found high arterial tension.



The patient, an ostler, was only thirty-eight years of age, had enjoyed good health, said he had been temperate, had not had gout or rheumatism, and was not the subject of lead-poisoning. He died on June 5th, the day after his admission, and the gangrene was found to be due to thrombosis in the pulmonary artery. It would thus appear that the state of blood which leads to thrombosis gives rise to high tension.

I have not time to enter at all fully upon the subject of high arterial tension in pregnancy. It has been well worked out by Dr. Mahomed (to whose paper I would refer you) and by Dr. Galabin. The illustration afforded by pregnancy of the relation between a condition of the blood and arterial tension, and between this latter and kidney disease, convulsions, thrombosis, &c., is, however, too important and too instructive to be passed over. You are aware that during pregnancy the blood of the mother has to carry nutrient material to the rapidly growing fetus, and to convey away the effete products of its active tissue changes; it is therefore more highly charged both with raw material and waste, and a high tension prevails in the arterial system. You know also that albuminuria is not uncommon in pregnancy; not only is this the case, but contracted granular kidney is sometimes met with in women, for which no cause but pregnancy can be assigned. These are exactly the results we have seen to arise from retained nitrogenised waste. But the parallel can be continued much further. Puerperal convulsions, if not uræmic, are closely allied to uræmic convulsions, and in the production of both, high arterial tension is an important factor. Puerperal thrombosis, again, whether cardiac, giving rise to sudden death &c., or in the iliac veins, producing phlegmasia dolens, is the precise equivalent of the thrombosis we have just been speaking of in the pulmonary artery. You will understand from what I have just been saying that the old practice of bleeding pregnant women was not always injurious; to some it must have been of immense benefit.

One or two other illustrations of the therapeutic indications given by high arterial tension, and we have done with this part of our subject. I have already mentioned the case of a courier now in hospital, who came in with a history of Roman fever, which was not apparently, as we generally find, a euphemism for typhoid fever contracted at Rome. He complained of extreme weakness and depression, and this, with the probably malarial origin of his fever, induced me to give quinine. He did not improve, however; and after a time I determined to take the state of the pulse as my guide, marked high tension having been observed from the first. I gave accordingly aperients and iodide of potassium, with very good effect.

Another case is that of a gentleman, advanced in life, who was hemiplegic from cerebral hæmorrhage, whose helpless condition was made worse by extreme despondency and most distressing delusions. The arterial tension was very high, and, notwithstanding a state of great weakness, I recommended free purgation and iodide of potassium, with small doses of belladonna. His mental and emotional condition improved greatly, and for some time he was much better. After a time, however, he had a series of severe epileptiform attacks, traceable to, or at any rate associated with, a return of high arterial tension. Treatment of

the same kind directed to the removal of the tension was followed by cessation of the convulsions, which up to this time had been increasingly frequent and severe.

*Affections of the nervous system as a cause of arterial tension.* I have left myself scanty time for the consideration of this part of my subject, and yet it is of considerable importance. In the early stages of acute affections of the brain, and throughout chronic affections, there may be very great arterial tension, due to the influence of the nervous system on the arterioles; it has been very remarkable in some cases of cerebral tumour which I have observed. The arterial tension resulting from the disease of the brain may be taken for arterial degeneration, the cause of the disease. More than once I have seen this mistake made, and there is an instance in a foot-note to p. 457 of vol. ii. of Reynolds's System of Medicine. Occasionally unilateral arteriole spasm is found in hemiplegia on the paralysed side; the tension is not, as a rule, very great, and of course cannot be higher on one side than on the other, but the artery at the wrist will be smaller and the sphygmographic tracing different.

In many so-called functional nervous affections there is fugitive or persistent contraction of the minute arteries, and consequent tension. In the hysteric paroxysm the arterial spasm is remarkable, and it is the cause of the pale, limpid, watery urine which is secreted during an attack. In locomotor ataxy the general condition of the minute arteries is one of contraction, which, during the paroxysms of pain to which such cases are liable, amounts to spasm. I have met with this condition of the vessels in what was apparently incipient insanity, in a lady, as shown by jealous delusions, unfounded general suspicions, and violent and eccentric conduct. Here, treatment suggested by the state of the arteries (Calabar bean, iodide of potassium with arsenic, and cod-liver oil) was followed by restoration of the mental equilibrium. I have seen it again in a lady subject to epileptoid paroxysms attended with mental confusion, but not by loss of consciousness. In most cases of nervous breakdown from overwork there is arteriole contraction and high tension, which, however, often fluctuate greatly; in one case lately under my care, that of a distinguished Oxford undergraduate, the fluctuations were remarkable, and were associated with equally striking variations in his nervous symptoms. Where, in cases of this kind, the vascular tension is persistent, I have not found the treatment by purgatives and eliminants successful. I have before me notes of cases in which high arterial tension was associated, in a gentleman aged forty-three, with giddiness and staggering, emotional weakness, loss of the power of attention, and occasional attacks of vertigo, followed by vomiting and stupor; in another gentleman, aged fifty-two, of remarkable natural energy and activity, with loss of vigor and endurance, excitability and giddiness. On one occasion he passed urine in my consulting-room which had a specific gravity of only 1002. The specific gravity of his urine at other times was found to be 1025 and 1018. It contained neither albumen nor sugar. Other notes relate to a youth of eighteen who, for nearly twelve months, suffered from continuous headache with exacerbations; the cardiac and arterial signs of tension were very marked; he had no vomiting, but at one time I thought

optic neuritis was setting in. He ultimately recovered.

My experience would lead me to say that while nervous breakdown from overwork is attended with arterial tension, when it is brought on by anxiety, grief, or worry, this is not the case. I do not, however, speak positively on this point.

I must not forget to mention a fact to which Dr. Mahomed called my attention, and which I have verified—namely, that excitement or agitation sends up the arterial tension at once. I think it is simply from the increased frequency and force of the heart's action, which drives blood into the arterial system faster than it can run off by the capillaries at the normal pressure.

**Arterial relaxation and low tension.**—I have still to consider the conditions of system associated with an unnatural degree of relaxation of the minute arteries and an absence of the normal tension in the arterial system. For the production of tension in the bloodvessels, *vis a tergo*—that is, a certain degree of vigor in the action of the heart—is required; and when the pulse is weak, it is not always easy to say whether this is due to the heart or to the arteries, more especially as the heart loses strength when the arterial tension is habitually low, both because it has less work to do on account of the abnormally diminished resistance to the blood in the capillaries and arterioles, and because its nutrition must directly suffer from the imperfect supply of blood it will receive when the general arterial tension is low. You will remember that we have low arterial tension in most febrile conditions, but we exclude these from the consideration. The characteristic feature of the pulse of arterial relaxation and low tension is its shortness or quickness. In the intervals the vessel cannot be felt at all; it allows itself to be flattened and obliterated and lost among the structures, without offering any appreciable resistance; and when the pulsation comes, the artery seems to start into existence for a fraction of a second, and is gone again. I am speaking now, of course, of cases in which the arteries are not kept full by frequent and powerful action of the heart, as in pyrexia &c. The pulsation may be more or less strong when it comes, and the artery may vary in size, but the distinctive character is the quick or short unsustained tidal wave. In describing the pulse of arterial relaxation, I said it was large, but when the heart is acting so feebly that it does not fill out the vessels it will feel small. A pulse having the characters produced by a combination of a weak heart and relaxed arteries is no doubt what is meant when a pulse is called “shabby.”

I cannot speak so definitely of the diagnostic, prognostic, and therapeutic indications of arterial relaxation, as of tension; but one thing I have learnt respecting the cases in which this condition exists is, that they are most unsatisfactory cases to have to treat. It has appeared to me that undue relaxation of the small arteries is sometimes a cause of weakness and nervous depression by permitting undue loss of heat. It is the duty of the arterioles to shut off the blood from the surface of the body on exposure to cold, and so to protect it from being cooled down. When this function is imperfectly performed, the skin and the extremities may be warm, in spite of very low external temperature, but the body must lose heat rapidly from exposure to cold of successive portions of blood sent to the skin, and either the temperature

will fall or increased oxidation will be required to keep it up. In either case there is a heavier tax on the system, and only a very vigorous constitution can support it with impunity. A sufferer from depression so produced will exhibit his warm hands and skin as proofs of his excellent circulation. I had some years ago under my care for several successive winters a melancholy giant, almost the very tallest man I ever saw, and proportionately stout. During the summer he was well; no day was too hot for him, and he was capable of considerable and sustained exertion; but in cold weather he was depressed, miserable, incapable of giving his attention to his duties, and continually under the necessity of resorting to stimulants. All this time he was unconscious of external cold, and did not take cold, never wore an overcoat, and his hands were always comfortably warm. He could not understand that this very warmth was a cause and a mark of weakness, and refused to seek the protection from cold which he did not feel to need.

A clergyman, aged fifty-one, having a small country parish, consulted me in October, 1874. He was formerly robust, and had been a boating man at college, but he had been ailing for ten or twelve years, complaining chiefly of indigestion, with low spirits, sleeplessness, and a variety of symptoms and sensations about the head and heart, of which I should fail to convey to you any idea. The appetite was good, and the bowels acted regularly but inefficiently, the motions being pellety; urine apparently normal, but decomposing quickly. He looked thin, pale, and haggard, and his tissues were excessively lax. Pulse 90, soft, short, weak, and with no tension at all.

I could not find any cause for the break-down in my patient's health. He was not overworked, lived wholesomely, and was not unduly sedentary in his habits.

I may tell you what I recommended, but little impression was made on his symptoms. I obtained a better action of the bowels by means of a mild aloetic pill, and this having no good effect, tried blue pill, ipecacuanha, and rhubarb. I gave at different times iron, arsenic, digitalis, phosphorus, cod-liver oil, bromide of potassium, sulphate of zinc and extract of hop pills, securing also from time to time sleep by chloral, &c. You will trace the ideas which dictated this treatment; they were to improve the nutrition of the nerve-centres, and of the body generally, to raise the tone of the heart and minute arteries, to remove or quell nervous irritability, and to give rest. The diet was of course regulated. I should add that he could not take stimulants. He gave himself a holiday also, while under my care, but with only temporary benefit.

Another case, essentially similar, came under my observation about the same time. The patient, aged forty-five, had been complaining for three years of a dull pain in the head, which set in at 11 A.M., and went on through the day; with it was a kind of pain in the right leg, and, when worse than usual, also in the right arm. He did not sleep well, and was full of apprehensions; was emotional, and cried while describing his sufferings. Appetite good; bowels not open; pulse frequent, very weak, soft, short, and shabby. I only saw him twice, and do not think he was any the better for the treatment I ordered.

These cases would come under the term hypo-

chondriasis, but there were fewer fancied ailments and more deterioration of health than usual. Hypochondriacs go about from one physician to another with their cardiac, hepatic, intestinal, or sexual woes, and one comes to take less note of states of pulse, urine, &c., than one would if they were expected to remain under observation; but I am always glad when I find a pulse of high tension in such cases, as I think there is a better chance of doing good.

I must not leave you under the impression that want of tone in the arteries is always accompanied with pallor and leanness. I have noted it in stout, pale, flabby people, with a soft and inelastic, or a firm brawny skin. I have met with it also in individuals not only decidedly stout, but of an unnaturally high color, associated with a number and variety of nervous sufferings and nervous symptoms, of which I could give you no idea. No patients are to be more commiserated than some of these, who, looking to the uninstructed eye the picture of health, are the victims of miseries from which actual pain would be an agreeable distraction. What makes it worse is, that so little can be done for their relief. These cases are in special danger from alcohol.

One of the most marked cases of arterial relaxation I ever saw was in a gentleman who a few weeks later became insane. He was then in an extremely nervous condition, apprehensive of sudden death, and often thinking he was dying, causing great alarm and excitement to his family, unwilling for his wife to be a moment out of sight, but irritable, tyrannical, and unkind in his behavior towards her. He had lost all energy, slept badly, was weak, and soon fatigued. He was tall and well built, looked strong, but his voice was weak, toneless, and monotonous, and his articulation careless or slovenly. His pulse was small, weak, short, and shabby, to an extraordinary degree, and his hands were damp and clammy. He had lived a fast life when young. Accounts as to his recent habits with regard to alcohol were contradictory. I only saw him once, and the next news I had of him was that he was suffering from unmistakable melancholia.

In acute dementia, again, the pulse has been, in the cases I have seen, exceedingly weak, soft, and short, and the action of the heart frequent and irregular, indicating an entire absence of tone in the vascular system. I have found a marked deficiency of arterial tension in many cases of epilepsy, and have at present two cases under observation in which it is very striking. The pulse is very soft and short, but large and fairly strong, the blood seeming to shoot through the small arteries and capillaries without resistance. Another noteworthy point is that a deep breath or a change of position has an unusually great effect on the heart's action, which is hurried for a few beats, while, if the patient stoops, the face is flushed immediately, as if the arterioles were incapable of resisting the greater pressure due to the lowering of the head, and allowed the capillaries to be flooded with blood. It is difficult to say whether these patients are epileptic by reason of the relaxation of the arterioles or of the absence of the normal cohesion between the blood and tissues, or have this deficient vascular tone because of the condition of the nervous system which gives rise to the epileptic attacks; but, however this may be, I consider that the pulse affords an indication for

treatment. Whatever is found to effect permanent improvement in the tone of the arteries and to raise the vascular tension may be expected to do good. If the epilepsy is an effect of the want of arterial tone, the restoration of this may cure the epilepsy; if it is the epileptic condition of the nerve centres which is the cause of the want of tone, a remedy which removes the effect will probably have a favorable influence on the cause. May we not have here some explanation of the good effect of bromide of potassium which has been found experimentally to cause contraction of arterioles? Also of Trousseau's favorite remedy, belladonna? My attention has not been drawn sufficiently long to the connexion between epilepsy and low arterial tension to enable me to bring forward evidence as to the effects in epilepsy of remedies which improve the arterial tone. Years of careful observation will be needed for this. Nor do I find much assistance from looking over my notes of cases of epilepsy. I may refer here to the interesting case of—, who has just left the hospital. He has worked in lead, and has the blue line on his gums, but has had no colic or other saturnine diseases. He came into the hospital because on stooping, and especially to lift any weight, he became giddy and confused, and almost lost consciousness; and we at once saw, on causing him to bend down, that his bald head, face, and ears became crimson. He was liable also to heat and flushing of the head and face without this exciting cause, and at these times we have found the lobules of the ears of a deep purple color, and very hot. In this patient the fluctuations of the arterial tension were most remarkable; and our notes, taken at different times, record observations absolutely contradictory. What makes the case more interesting is the fact, discovered accidentally while the experiment was being made with another object, that pressure on the carotids, or on one only, almost immediately induced an epileptoid attack; the face flushed (even when the pressure was applied to the common carotid, which was remarkable), and the features were drawn into a peculiar smile; the patient looked confused, lost consciousness, staggered, and fell back upon his bed with slight general convulsive movements. A few moments later he looked round with a puzzled expression, wondering what had happened. There was no marked change in the size of the pupils at any period. He slowly improved while taking iodide of potassium and tincture of nux vomica; the lead-line disappeared, the flushing and vertigo in stooping were less marked, and the epileptoid attacks were less easily induced. Naturally, we did not repeat this experiment often. The combination in this case of fluctuation in the arterial tension, weakness of the vessels of the head and face permitting of the flushing described on stooping, with liability to artificial epilepsy, is peculiarly interesting as a parallel to the combination associated with true epilepsy. Taking lead to have been the cause of the condition, its action was no doubt primarily on the (sympathetic?) nervous system; and to the state of the nervous system was due the instability of the vascular system. But it is, in my own mind, an open question whether the liability to epileptoid attacks was not in turn an effect of the vascular instability and want of tone.

To make the account of arterial relaxation complete, I ought to consider exophthalmic goitre and

aortic pulsation, of which diseases it constitutes a feature, but I must pass them over with a simple mention.

My observations on low arterial tension have been discouraging, and I have as yet had little success to report from treatment, but it sometimes affords an indication which is of service. Many weak nervous women suffering from leucorrhœa or menorrhagia, or worn out by repeated pregnancies or prolonged suckling, or overwhelmed by domestic duties and responsibilities, have with anæmia and debility the pulse of arterial relaxation, and in these cases the addition of digitalis to the iron and other tonics often makes a great difference in the effect. My friend Dr. Fothergill gives these patients bromide of potassium and digitalis, and later quinine and iron with bromhydric acid. I saw them by scores in the out-patient department, but they are almost excluded from the wards by more urgent cases, and I have not yet tried his plan of treatment.

I must bring this lecture to a close. I have been, I fear, diffuse and sketchy, but I have been tempted to take up the subject, perhaps prematurely, by the interest some of you have manifested in it. I have seen you with extreme pleasure acquire thoroughly the art of discriminating between the different kinds of pulse and recognise the indications they afford, and I wish to put you in possession of whatever knowledge I have which may make your study useful to yourselves and your patients.

## A Lecture

ON

### MAN IN HIS ANATOMICAL, PHYSICAL, AND PHYSIOLOGICAL ASPECTS.

*Introductory to a Course of Lectures on the Institutes of Medicine (Physiology).*

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GENTLEMEN,—In entering on my duties as Professor of Medicine and Anatomy in your ancient and honorable University, it is incumbent on me to pay a passing tribute to the memory of my distinguished predecessor, the lamented Dr. Oswald Home Bell.

It was my misfortune to know Dr. Bell very slightly, but the little I did know was of the most favorable tenor. He appeared to me to be a man of rare judgment, tact, and industry. He was admittedly conscientious and honorable, but he was more; he was a typically kind and generous man—a man of broad, charitable views. Higher praise can be accorded to no one. As most of you are aware, Dr. Bell had a distinguished University career. He put forth flowers which promised abundant fruit. Had he lived, and had he chosen to devote himself to science instead of practice, for which he had a rare genius, there can be no doubt that he would have attained to high

academical distinction. As it was, he worked indefatigably for the good of others, and suffering humanity, I am told, never appealed to him in vain. His career, though brief, was eminently useful, and it is distressing to think that one so universally beloved should have been removed so young. Of him it might truly be said, he was "active in business and fervent in spirit." He has left innumerable friends, and, it would appear, no enemies. As his life so was his death, full of earnestness and truth. Those who knew him best mourn him the most, and there are, I feel, none present who will not join me when I repeat the few last mournful words, *Requiescat in pace*.

I could have wished to say more, but after the touching eulogium passed upon Dr. Bell by our distinguished Principal, in his opening address, further remarks from me must appear superfluous. I will therefore turn to my introductory lecture. The subject I am called upon to teach is so vast that I have had considerable difficulty in selecting a topic. This difficulty has been increased from a feeling that on the present occasion I would be addressing, not a body of medical men, but a body of philosophers, scholars, and literati. I have, on reflection, chosen a theme which I hope may possess a general interest even to the non-professional—viz., *Man in his Anatomical, Physical, and Physiological Aspects*.

It has been truly said that the study of mankind is man, and I am free to confess that I know of no nobler study, if it be pursued, as it ought to be, in a liberal and strictly scientific spirit.

Of all created beings man unquestionably occupies the first place. He is god-like as to form, divine as to intelligence. He may be said to constitute the last link in creation. In point of time he was the last to be created; but, being created, everything endowed with life was made subject to him. He forms, as it were, the last of an indefinite series, and in this respect is to be regarded as in some measure intermediate between the other members of the animal kingdom and his Maker. "And God said, Let us make man in our image, after our likeness; and let them have dominion over the fish of the sea, and over the fowl of the air, and over the cattle, and over all the earth, and over every creeping thing that creepeth upon the earth."\* Not only was man the last to be created, but very considerable preparation was necessary before he could take his place in nature. This is evident alike from the sacred writings and from geological records. The geological argument has been stated with great force by Sir Humphry Davy as follows:—"In those strata which are deepest, and which must, consequently, be supposed to be the earliest deposited, forms even of vegetable life are rare; shells and vegetable remains are found in the next order; the bones of fishes and oviparous reptiles exist in the following class; the remains of birds, with those of the same genera mentioned before, in those of the next order; those of quadrupeds of extinct species in a still more recent class; and it is only in the loose and slightly consolidated strata of gravel and sand, and which are usually called Diluvial formations, that the remains of animals such as now people the globe are found, with others belonging to extinct species. But, in none of those formations, whether called secondary, tertiary, or diluvial, have the remains of man, or

\* Genesis i. 26.

any of his works, been discovered; and whoever dwells on this subject must be convinced that the present order of things, and the comparatively recent existence of man as the master of the globe, is as certain as the destruction of a former and a different order, and the extinction of a number of living forms which have no types in being.\*

Sir Charles Lyell writes in a very similar strain. He observes:—"We have been fairly led by palæontological researches to the conclusion that the invertebrate animals flourished before the vertebrate, and that in the latter class fishes, reptiles, birds, and mammalia made their appearance in chronological order analogous to that in which they would be arranged zoologically according to an advancing scale of perfection in their organisation. .... To crown the whole, the series ends with the *Arencephala*, of which man is the sole representative."

It is customary to speak of man as the lord of the creation, nor can this lofty title be well denied him since revelation and science equally support it. He is mentally and physically fitted for command. It is not my intention, however, on the present occasion to speak of intellectual man. As your Professor of Medicine and Anatomy, I shall best occupy your time by regarding him from a corporeal or bodily point. While claiming for man the first place in creation, I am not one of those who seek to elevate man by depressing the lower animals. All are perfect after a fashion. To argue otherwise would be to attribute imperfection to the Deity. Man has very many points in common with the brutes that perish, not only physically but mentally; and so far from denying those points of analogy, affinity, and it may be of actual consanguinity, I am proud to think that God in his great goodness has surrounded us with so many beautiful creatures, not a few of them having even beautiful dispositions. Granting, however, that man is, as to his animality, not far removed from the highest of the lower animals, and that he possesses certain mental traits in common with them, I still maintain that he is *facile princeps*, and that there is a great gulf between him and his congeners which science has hitherto failed to bridge. The gulf is chiefly an intellectual gulf, for it cannot be doubted that there is a greater chasm between man and the higher apes, as regards intelligence, than there is between the several kinds of apes and the organic forms immediately below them. "When it is said that the human race is of far higher dignity than were any pre-existing beings on the earth, it is the intellectual and moral attributes of our race, rather than the physical, which are considered, and it is by no means clear that the organisation of man is such as would confer a decided pre-eminence upon him, if, in place of his reasoning powers, he was merely provided with such instincts as are possessed by the lower animals. .... Linnæus declared that he could not distinguish man generically from the ape, and Professor Owen has spoken of the 'all-pervading similitude of structure—every tooth, every bone, being strictly homologous,'—yet the same great anatomist considers man's superior cerebral development as entitling him to be placed in a sub-class apart from all the other mammalia."

It has been customary of late years to draw ani-

mals in all sorts of fanciful positions, and to give them interesting expressions. This has been especially the case with the anthropomorphous apes. Thus the orang-utan, chimpanzee, and gorilla have been ingeniously represented in semi-erect positions, and grinning as only apes can grin. The naturalists, however, have failed to convince the majority of mankind that man is the immediate descendant of the gorilla. Animals undoubtedly have expression, but the erect posture and the wonderful play of features indicative of an almost divine intelligence are, to a great extent, peculiar to man. He is the only creature who can be said habitually to maintain an erect attitude, and who can laugh, cry, and speak. Certainly there is no known animal which can use its hands to such purpose, and between whose head and hands there is such perfect co-ordination. If man, as Darwin and others try to make out, is actually descended from the lower animals by infinite transmutations in infinite time, the supporters of that view (and it is a great, grand, and original view) must admit, that they have hitherto failed to find the missing link. To prove this theory, an animal approaching man much more closely than the orang-utan, chimpanzee, and gorilla must be found living or dead. No such animal, however, can be discovered. The solitudes of tropical forests and the vast recesses of an expectant geology have hitherto been searched in vain. While, however, there is admittedly a missing link, it becomes us to bear with the evolutionists—those patient, earnest, indefatigable workers. They are engaged in a mighty undertaking, and until their labors are completed no verdict can be given. Let us, as scientific men, be liberal. Let us agree to differ. It is truth that is sought, not self-aggrandisement. There can be no science where there is dogmatism. Liberty of thought and action is the birthright of every original inquirer, and everyone who attempts to stifle this is a mere cumberer in the field he pretends to cultivate.

If the evolutionists accomplish no more, they have already accomplished much; they have shown us that from protoplasmic albuminous-looking masses rudimentary animals may be developed, and that, step by step, in endless succession and in infinite time, a graduated series of organic forms may be evolved; each member of the series dovetailing into that immediately above and immediately below it. They have thrown much light upon the complicated questions of natural affinity, the homologies of organs in various animals, and the recurrence in the embryos of the higher animals of structural peculiarities found in the lower ones. They have connected, as by a silver thread, the various palæontological forms in time, and the several faunas and floras in space. They have endeavored to establish an actual genealogy and consanguinity of organisms.

The evolutionists begin with the lowest and end with the highest. This system may be fitly represented by a chain. They say, given the first link, living protoplasm, in the shape of an amoeba or some degraded type, we may have a second link representing a higher living form, and so on until man himself is reached. You cannot, however, say they, have the highest type without the lowest, and the presence of the highest and lowest types indicates the existence, past or present, of intermediate types. There is, therefore, in evolution a similarity and a sequence. The evolutionists ap-

\* Sir H. Davy: *Consolations in Travel*, Dialogue iii., "The Unknown."

† *Principles of Zoology*, 10th ed., vol. i., p. 165. London, 1867.

pear to me to err rather in their premises than their conclusions. They crave one or more living types developing into myriad living forms, and infinite time for their transformation. Their argument is virtually a *petitio principii*. If it takes a million years to form a man from a mollusc, then it is quite evident that no man or generation of men can hope to see the transformations as they occur. They can see and recognise species when created, but they cannot see the actual creations as they occur. In short, they can see the perfect chain, but not the process of link-making. If we take man as an example, we know from ancient sculptures and mummy pits that his form has not varied, even in the slightest, for several thousand years. The same may be said of many domesticated plants and animals, as, for instance, Egyptian wheat and the sacred animals of the Nile. The evolutionists, however, look upon a thousand years as a small matter in the transformation of living forms, and this element of time forms, it appears to me, at once the strength and weakness of their position. The evolutionists represent the Creator not as a being whose work is finished, but whose work is progressing. They regard the world and all it contains as a vast panorama which moves continually.

"When first the doctrine of the origin of species by transmutation was proposed, it was objected that such a theory substituted a material self-adjusting machinery for a supreme Creative Intelligence. But the more the idea of a slow and insensible change from lower to higher organisms, brought about in the course of millions of generations, according to a preconceived plan, has become familiar to men's minds, the more conscious have they become that the amount of power, wisdom, design, or forethought, required for such a general evolution of life, is as great as that which is implied by a multitude of separate, special, and miraculous acts of creation."

The evolutionists are not to be confounded with the advocates of spontaneous generation. These latter deal with a still wider question, for they maintain that neither living protoplasm nor a living type is required to begin the animal series. They regard life as an accidental result, due to an accidental assemblage of dead particles under favorable circumstances. They say, given certain matters and certain conditions, such as heat, light, moisture, &c., and life will inevitably result. They require no parent or germ; theirs is life *de novo*.

Whatever man's descent, whether the offspring in a remote antiquity of stray particles deftly arranged by physical forces, or an evolution of living matter acted upon by vital and physical forces, or a separate creation in which he appeared perfect as he is when fresh from the hands of his Creator, matters little, if we regard him from a merely anatomical, physical, or physiological point. It is the duty of the anatomist, physicist, and physiologist to look upon man simply as an organism—i.e., an assemblage of organs or parts, each of which has a definite function to perform. Regarded as an organism he still stands at the head of the animated kingdom. In man we behold the highest degree of differentiation. In him there is a greater number of parts, and the parts are more divinely attuned. It may be as well at this stage briefly to explain what is meant by differentiation. In the lowest plants and animals the individual consists of a single cell—i.e., a globular, jelly-like, proto-

plasmic mass, invested with a more or less perfect envelope. This cell is endowed with wonderful vital properties, for it lives, grows, and reproduces itself. All its parts, however, are homogeneous; in other words, each part resembles every other part. The cell, or cell-plant, or cell-animal, as happens, is therefore said to be undifferentiated. As we rise in the scale of being, the cells in plants and animals break up, coalesce and interweave to form organs; each organ consisting of heterogeneous parts arranged according to a given plan, and performing a definite function. Thus, in plants and animals there are the respiratory and reproductive organs—i.e., portions of the plant or animal especially set apart for respiration and reproduction. The eye is regarded as the organ of sight, the ear of hearing, and so on. The parts or organs increase as we ascend from the lowest to the highest forms; and a plant or animal is said to be differentiated according to the number of organs composing it, and the complexity and variety of the functions performed by those organs. An organism is necessarily composed of parts, and the higher organisms are to be regarded as the aggregation of organs, all of which are more or less complex. Man, then, regarded as an organism—i.e., an assemblage of parts variously constituted and performing various functions,—is the most highly differentiated of all living beings.

As it is impossible to speak of an organism as apart from its organs, so it is impossible to speak of an organ as apart from the matter composing it. It is necessary therefore, even at the risk of being tedious, to say a few words regarding organic and inorganic matter, and vital and physical force. As anatomists, physicists, and physiologists, we cannot escape from matter; neither can we escape from the forces which actuate that matter as such. All living things proceed directly or indirectly from the material universe. There we find a store of matter and a store of force which are virtually inexhaustible; all the more inexhaustible because the matter and force of the universe are indestructible. We cannot annihilate matter, neither can we annihilate force. We can change the form of the matter and the direction of the force, but here our powers cease. If matter and force are taken from the universe to build up a plant or an animal, they both return to it when the plant or animal dies. The universe is not only the great laboratory where everything living is fashioned; it is also the vast lumber-room where everything dead is stored. It is the huge magazine of extinct or geologic forms. The organic rises out of the inorganic, and returns to it. We cannot speak of even the lowest plant or animal, still less of man, without referring to the matter of the universe.

By organic matter is meant matter as it exists in living plants and animals, or in plants and animals that have once lived; by inorganic matter is to be understood matter as it exists outside plants and animals—i.e., in the mineral kingdom.\* By vital force is meant force as manifested in living forms; by physical force, force as it exists in the universe as a whole. The vital forces prevail in life, the physical ones in death. The play of matter and force is seen to perfection in the formation, growth, and death of plants and animals. Mineral matters

\* Water, chloride of sodium, chloride of potassa, carbonate of potassa, carbonate of lime, &c., are examples of inorganic substances; starch, sugar, fats, fibrin, albumen, casein, peptone, &c., of organic ones.

and physical forces, in the natural order of things, precede vegetable matters and vital forces, and vegetable matters and vital forces precede animal matters and mental forces. Thus to form and support a plant we must have mineral substances and vital and physical forces; and to form and support an animal we must have vital and physical forces and mineral substances *plus* plants. An animal can only exist through the plant; it cannot live upon inorganic substances. The plant alone possesses that vital or vito-chemical laboratory which can assimilate inorganic materials, and convert them into food for itself and for animals. Plants are the great producers in nature, animals the great consumers. The elements enter the bodies of animals by a somewhat circuitous route. Animals feed upon plants, and plants upon inorganic matter obtained from the soil and air. Animals for the most part obtain their elements indirectly from the plant or other animals. The plant precedes the animal in the same way that inorganic matter precedes the plant. The elements, as it were, circulate within plants and animals. Thus vegetables absorb from the earth and air carbonic acid, watery vapor, and nitrogen; they give off oxygen, and retain carbon and hydrogen. Vegetables build up organic matter under the influence of solar heat and form the food of animals; but the animals thus formed return to the soil and the atmosphere the materials supplied by plants, either during their lives or at their deaths. Animals give off what plants retain—viz., carbonic acid, hydrogen as a constituent of water, and free nitrogen in the form of ammonium oxide. The animal kingdom is to be regarded as an apparatus of combustion, the vegetable kingdom as one of reduction. The metamorphosis which certain of the elements undergo in plants and animals may be briefly stated:—"Rain water, loaded with the carbonic acid of the air, falls upon calcareous hill, and carbonate of lime in a state of solution enters rivers, and is by them carried to the ocean, where it is seized upon by millions of animals, and converted into their external skeletons or shells. The water of rivers and springs also is absorbed by plants, and drunk by animals, and so lime enters into their substance, and is converted into various salts of that base, such as oxalates, tartrates, phosphates, &c. Phosphate of lime is the principal element of the bones, besides entering more or less into the constitution of the other tissues of the superior animals, which are continually excreting as well as assimilating it. Lastly, on their death, the lime is dispersed in various ways; even the bones crumble to pieces, and so the mineral returns to the soil from whence it came. Sulphur passes from one region to another, in a similar manner—from the sea, which contains sulphur in large quantities, to the atmosphere, thence to the soil, and thence to plants and animals, from whence again it returns to the bosom of the ocean. These incessant changes between the soil or atmosphere, plants and animals, constitute the theory known as the chemical balance of organic nature."<sup>\*</sup>

In all these beautiful transformations we have marked evidence of design. The mineral kingdom is necessary to the vegetable kingdom, and the vegetable kingdom to the animal kingdom. Some, indeed, even go the length of saying that it is im-

possible to draw a line of demarcation between the mineral and vegetable kingdoms on the one hand, and between the vegetable and animal kingdoms on the other, and that in reality there is but one kingdom, which embraces all three. These philosophers look upon *all matter as one and all force as one*. Thus Tyndall remarks that "everywhere throughout our planet we notice a tendency of the ultimate particles of matter to run into symmetric forms. The very molecules appear inspired with a desire for union and growth, and the question of questions at the present day is, How far does this wondrous display of molecular force extend? Does it give us the movement of the sap of trees? I reply with confidence, Assuredly it does. Does it give us the beating of our own breasts, the warmth of our own bodies, the circulation of our own blood and all that thereon depends?..... You can pass on by almost imperceptible gradations from this wonderful display of force..... to the lowest forms of vegetable life. I pass from them to other forms higher, and so up to the highest. .... One class of thinkers suppose that all the actions of crystals, that the passage from crystalline action to the lowest forms of vegetable life, and from them to the higher forms still, and so on to the highest,—I say, one class of thinkers regard this as the growth of a single natural process. They grasp, as it were, this act of life, this development of life, as an indissolubly connected whole—one great organic growth from the beginning. Others again say that it is not possible to pass from inorganic, as we are pleased to call it—for remember it is only human language we can use,—from the inorganic to the organic without a distinct creative act, and so with regard to the forms we observe."

It will no doubt appear to many, if not to all, far-fetched to speak of man as a direct evolution from inorganic matter by an elaborate and complicated series of transformations, but as this is the view adopted by many advanced thinkers of the present day, I feel it incumbent on me to state it.

Human anatomy derives its fullest interpretation from comparative anatomy and zoology. Man has so many points in common with the lower animals that he cannot conveniently be separated from them. The anatomists of the seventeenth century were so fully convinced of this that they labored incessantly at comparative anatomy. They comprehended the great fact that man is to be regarded as the epitome of the whole animal kingdom, and that what is obscure in him is illustrated and simplified by an examination of corresponding parts in the animal series. Impressed, moreover, with the dignity of man, they sought, by observation and experiment on the lower animals, to discover the functions performed by the several parts of the human body, with a view to founding thereon a rational system of medicine. Apart from the interest which attaches to the study of comparative anatomy and zoology, there is a very tangible and positive gain. No one can fully appreciate what is meant by human anatomy who is not familiar with the leading principles of zoology and comparative anatomy. Comparative anatomy is to human anatomy what a mirror is to an object reflected in it. In like manner, no one can intelligently administer medicine to a human patient who is ignorant of the effects produced by it on the lower animals. A perfectly educated physician

<sup>\*</sup> Outlines of Physiology, by J. Hughes Bennett, M.D., F.R.S.E., &c., p. 7. 1872.



should also be master of the veterinary art. Scientific medicine rests directly on anatomy, human and comparative. To know the function of a part we must be conversant with its structure; to understand disease we must be familiar with the laws of health; to comprehend what is meant by death we must grasp all that is included in the term life.

By anatomy, in its widest sense, is meant a knowledge of all the structures which enter into the formation of all plants and all animals, man in particular. By physiology, in the same sense, is meant a knowledge of the function performed by the several parts of all plants and all animals, man included. Physiology begins where anatomy ends.

An anatomist is expected to know, not only the actual structure of the parts entering into the formation of plants and animals, but their mutual relations in every individual and throughout the organic series. In like manner, a physiologist is expected to be familiar with the functions performed by the parts composing all plants and all animals. Physiology teaches us the nature of life and the laws which govern it. The simpler the form, the lower the life; the more complicated the organism, the higher the life. In man every organ has its peculiar life—the life of the individual representing the aggregate life of all the parts. A living being is living and dying throughout its whole substance and throughout its whole existence. In it “we observe an uninterrupted admission and assimilation of new, and a correspondent separation and expulsion of old particles. The form remains the same; the component particles are continually changing. While this motion lasts, the body is said to be alive; when it has irreversibly ceased, to be dead.”\*

The idea of death is terrible to sensitive minds; but, after all, death is only an idea—it is not annihilation. As we did not make ourselves, neither can we annihilate ourselves, or be annihilated. The body, even when full of life, is in great part dead. Seventy per cent. of that body is indeed water—a by no means stable substance; and some recent observers even go the length of asserting that only one-fifth part of the body lives. Granting that only a fifth part of the body lives, even in the heyday of youth, and that dead particles are constantly passing into the body as food and out of the body as excreta and effete matters, the balance, it will be perceived, inclines rather in the direction of death than of life. Assuredly the being of to-day is no longer the being of yesterday. If this be so, it behoves us to familiarise ourselves with death, this representing the major part of our sublunary existence. All will admit that the body instinct with life is a mechanism instinct with beauty; few will deny that that same body is beautiful in sleep. As an anatomist, I will go further and maintain that it is beautiful in death. The pale skeleton leaf is more remarkable in its intricate tracery than the leaf as seen on the tree; and so of a body in death. Of a truth we are fearfully and wonderfully made; and if we wish to behold the absolute perfection of our bodies we must remove the delicately flushed skin and expose bloodvessels, nerves, muscles, and bones in endless and perplexing succession. There is nothing terrible in all this to one who seeks knowledge for its own sake, and who is resolved to know things as

they really exist. We do not shrink from the presence of a shell; why should we shrink from the presence of a skeleton? The one is an external, the other an internal support. Equal familiarity with both would make both equally pleasing. The skeleton is ghastly only to the uninformed; to the philosopher it is full of beauty. The dome of the head (that marvellous arch which contains the brain) is one of the finest domes ever constructed: the face is full of buttresses, supports, and side arches, which delight the very soul of the architect; the vertebral column displays Hogarth's line of beauty to perfection, and gives to the trunk its graceful curves and attitudes; the thorax, broad, rounded, and burly, encases as with bars of steel the vital and delicate organs of the heart and lungs; the limbs, slightly curved and twisted and tapering as they run, terminate in fingers and toes of transcendent agility and grace. In a word, the skeleton is to be regarded as a perfect mechanical marvel. It is an epitome of all architecture. It is stronger, firmer, and lighter than any similar structure hitherto devised by man. It displays in itself every form of joint and every form of support, surface, and lever employed in mechanics. Did not the illustrious Paley show that in the skeleton the Deity himself was reflected? What holds true of the skeleton or hard parts of the body is equally true of the soft parts. The bloodvessels and nerves (the one planted in the heart, the other in the brain) ramify from within and from without, like twin trees, whose branches intertwine and interweave with an infinity of love at innumerable points. The bloodvessels convey nutrient material to the tissues and carry effete matters from them; they are to the body what a river is to a city. The nerves convey impressions from all parts of the body to the brain, and the brain through them flashes back intelligent movements to all parts of the body; the nerves are to the body what telegraphic wires are to a people. The muscles, full, rounded, and swelling, give strength, symmetry, and beauty to the form; they are to the body what a steam engine is to machinery. The lymphatics meander everywhere and overlie the body in a rich network; they are to the body what the leaves and roots are to a plant—they absorb the food on which the body lives. If we go deeper we find other systems. There is the respiratory system, where the blood is purified and changed from a dark purple to a bright scarlet; the digestive system, where the food is cooked and metamorphosed so as to be readily assimilated; the reproductive system, where the future being is mysteriously elaborated; the secretory system, where certain silent-working glands manufacture juices which give a piquancy to all the fluids and solids of the body; and the excretory system, which may justly be termed the scavenger system, inasmuch as it removes from the body politic the effete matters which if retained would prove injurious, if not destructive.

To see these several systems, and to make out and comprehend their mutual relations, we must anatomise. We must draw aside the veil. But this unveiling reveals a higher, or, if you will, a deeper beauty—deeper because hidden. The interior of a watch is more remarkable than its exterior, and this is a hundredfold more true of our own bodies. The painter and sculptor seize upon externalities, and enchant us with their glowing colors and flowing outlines; the anatomist lays

\* Lectures on Physiology, Zoology, and the Natural History of Man, by Sir Wm. Lawrence, Bart.; p. 83.



have the beauty which the integument imperfectly conceals. No one can be a painter or a sculptor who is not also an anatomist; and no one can admire the living body as he ought who turns away from and despises the dead body. Every part of the dead body is replete with beauty. If I were to show you the structure of the heart, or indeed of any one of the organs, you must admire.

As a knowledge of anatomy is necessary to a knowledge of physiology, so a knowledge of physiology is necessary to a knowledge of health. Disease is health perverted, and can only be understood through anatomy and physiology, human and comparative. Anatomy in the present day relies for its advancement upon the scalpel and microscope; physiology upon physics and chemistry. To know the structure and uses of a part, we must be able not only to anatomise and analyse its substance, but also to explain its movements. As in anatomy and physiology we cannot escape from matter, so we cannot escape from physics. Everything that lives is material. But material living things display physical properties: living plants and animals are heavy, elastic, porous; many animals display in their bodies the various forms of levers, the pulley, hydrostatic and pneumatic arrangements, and a host of mechanical contrivances. While we inhabit the earth, we are as much a part of it as any of its mountains or rivers. In this sense we are citizens of the world—sons and daughters of the universe. It is this intimate connexion with the matter and force of the universe which makes us amenable to climatic changes; which makes us laugh in the sunshine, and weep in the shade. There is nothing in nature which does not find an echo in man. If the wind whispers in the woodland or softly trembles in the Æolian harp, a responsive chord is instantly struck; and if the lightnings flash and the thunders roll, an innate dread, commensurate with the sublimity of the occasion, is at once engendered.

As the matter of which our bodies is composed is to be regarded as a special contribution from our Maker, so the mind which actuates our bodies is to be regarded as an emanation from the great Mind which rules the universe. In our bodies we behold the perfection of matter; in our minds, alas! only the refuse of a divine attribute. Man, great and grand as he is, is somehow disjointed and broken. Whereas external nature holds on the even tenor of its way, he is liable to disease and dissolution. Whereas the vast mind of the great Lawgiver is true to his sublime purpose and the final issue of things, the mind of man is painfully vacillating and weak. It is as a stray beam to the mighty effulgence of the sun. Still man, even fallen man, is a mighty creature; and that science which deals even with his physical part is a great science. No form of education, however exalted, can afford to set aside anatomy and physiology, and, by implication, natural history, physics, and chemistry. The leading spirits of the great European universities have long seen and felt this, and it seems to me the day is not far distant when these subjects will be taught in every seminary in the land. Already Cambridge has what is known as its "Natural Science Tripos," in which a Master of Arts degree is conferred for efficiency in natural history, geology, chemistry, anatomy, physiology, physics, botany, and cognate subjects.

The physicist and chemist are necessary to the

anatomist and physiologist; and I cannot help observing that the founders of the chairs in the University of St. Andrews have shown much sagacity and wisdom in combining anatomy and medicine, and in associating therewith natural history and chemistry, and indirectly natural philosophy. The circle of the sciences widens every day, and Britain begins to feel that unless every department of learning is sedulously cultivated she will cease to be a leader among nations and a pioneer in civilisation and progress. In this we have an explanation of the not unreasonable clamor for science schools, education chairs, and—last, not least—State medicine and hygiene. The period has at length arrived when a knowledge of the laws of health is imperative, not only as regards the leaders of the people, but the people themselves. Ignorance of these laws has already produced incalculable mischief; and civilisation cannot hope to advance in squalor and filth, for these are synonyms of disease and death. Our large manufacturing towns are scourged with pestilential fevers which science can well avert, and there is no reason why the stunted populations of hard-working and crowded centres should die prematurely. It is lamentable to find comparatively well-educated people wholly, or next to wholly, ignorant of natural history, botany, chemistry, and physics, and—what is more inexplicable—of the structure and uses of their own bodies. How, I might inquire, as a medical man, can a people hope to be healthy who are unacquainted with the laws of health? How can brains be functionally active which are imperfectly nourished, or, what is just as bad, overfed? Is it possible to have a healthy mind in an unhealthy body? Is there no truth in the Latin maxim, *Sana mens in corpore sano*? The alarming increase of insanity of late years conclusively proves that a knowledge of medicine is becoming imperative, not only in professional men, but in all classes of society. The clergyman and jurist should know medicine, if only for the purposes of illustration. The question frequently asked of late years is, "But how is medicine, and the subjects included in medicine, to be made interesting to the many?" I reply, By making them all-embracing. Let us look at man not as an isolated individual, a knowledge of whom can only be acquired in the dissecting-room. Let us look at him as one of the great animal series, and let us contemplate that series in its infinite ramifications and in its totality. Let us regard animals as the indirect product of plants, and plants as the direct product of inorganic matter. Our interest will increase as the subject widens. The more we look into Nature the more we shall love her. No one who observes and thinks can be insensible to the beauty of the mineral kingdom with its galaxy of precious stones; no one who watches the flower open up its innermost recesses to the sun but must feel there is a sympathy between them; no one who looks into the clear blue waters and observes the sea-anemones coquettishly conceal and as coquettishly display their delicate charms, but must know they are in perfect harmony with their surroundings. There is a poetry in the plant and the lower forms of animal life, clinging to the ground like living anchors; for fixity begets helplessness, and helplessness sympathy. But there is a far higher poetry in plants and animals which move, for here there is sensibility and reciprocation. The sensitive plant responds to your touch, and is aware of your

presence. The floating medusa pulsates with life and joy. The sunlight and the breeze evoke activity where there is life. The plant throws off its seed to be scattered by the winds. The same wind ravishes one flower and fructifies another. The bee, on busy wing intent on gathering nectar, assists in the fructifying process. The bird, flitting from tree to tree, swallows the dainty fruit and plants it in some inaccessible but suitable region. The sunlight, the breeze, the flower, the fruit, and the bird are all for man. Is it possible, then, that one so highly favored can take no interest in the beings among which he lives and moves? I hold apathy on this head to be wholly inexcusable. If apathy does exist, I believe it to be entirely due to the fact that we are not taught when young to study the great book of Nature. The mighty volume is not unfolded as it ought to be when our minds are most susceptible. We are not encouraged to examine plants and animals as living things which have a mission to perform, which have a geographical distribution in time and space, and which are useful to man, not only as affording healthful recreation to the mind, but aliment and clothing to the body. Where would man be if left to himself? He is only great as the greatest of all created beings. It is dependence and interdependence which make life enjoyable. We must live, not for ourselves only, but for others; others in the widest and best sense—to wit, the whole animated kingdom. Happiness flies from us in proportion as we narrow our sympathies. The more I reflect upon the subject of education the more I am convinced that one of the grandest avenues of human knowledge is at present all but blocked up by ignorance, superstition, and prejudice. I refer to the great avenue of natural science. Languages, logic, arithmetic, mathematics, &c. are all necessary; but they should have as their foundation natural history, anatomy, physiology, chemistry, botany, and physics. What more natural than to teach children that there is a world outside of themselves—a sky, a sun, a moon, a plethora of stars, a wide expanse of land, a vast ever-changing ocean, an arcadia of plants, and an interminable series of animals which live and die as they do.

A child, when introduced into the world, should be taught his place in nature. The flower, the butterfly, the bird, and the beast are the natural companions of the child; why should they not be properly introduced to each other? If children and youths were taught to observe the habitats of plants and animals and the purposes subserved by them, they would naturally be tempted to examine their structure. In this they would have congenial occupation, and would form habits of close observation and reflection, which could not fail to be eminently serviceable to them in after-life. When mind and body are both expanding, healthful recreation should be blended with study. I can conceive nothing more painful than to see a ruddy energetic child puzzling over a sum in a corner. The same child, a thousand to one, would take delight in pulling a flower, or in catching an insect, and very little coaxing would be required to get him to dismember and examine one or both. This tendency to break up, and in some senses to destroy, only requires direction to produce a race of anatomists and physiologists of which Britain would be justly proud. Book lore is all very well; I have nothing to say against that. Everything is

good in its own particular season. What I complain of is the rearing of British youth as if there were no green fields, no flowers, no birds, no beasts, no design, no great First Cause. We do not want mere bookworms—men who dogmatise from their closets and contemplate everything through colored glass. We want active, earnest, practical workers, who take nature as she is, and who observe, think, reflect, and act for themselves. We ought to know, not only our place in nature, but how to keep it. We ought to work at, and not dream about, art. Nature and art are both practical. If there is power in us, it ought to manifest itself in a practical form; it ought to resolve itself into motion in one direction or other. Whichever direction this motion takes ultimately, I sincerely hope that in our youth, at least, it may be spent in contemplating God's most marvellous works. Let us seek, and we shall assuredly find

"Tongues in trees, books in the running brooks,  
Sermons in stones, and good in everything."

## A Clinical Lecture

ON

### THE BEST MANNER OF EMPLOYING INSTRUMENTS IN CASES OF STRICTURE WHERE MUCH DIFFICULTY EXISTS.

*Delivered at University College Hospital on November 25th, 1875.*

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(Reported by Mr. G. BUCKSTON BROWN.)

I HAVE now to consider the question, How are you to deal with a case of stricture of the urethra in which real difficulty exists in passing an instrument into the bladder? Let a case be supposed in which attempts have been made, perhaps by several hands, and hitherto without success.

First, let me point out in what the chief mechanical difficulties in such a case might consist. There are four:—

1. Extreme narrowness of the stricture.
2. The stricture may be tortuous.
3. It may be complicated with false passages.
4. The urethra behind the stricture may be irregularly dilated and reticulated.

Difficulties of another kind, not mechanical, are frequently met with; these are two in number, and are to be considered hereafter—viz., (1) the stricture may be very resilient, and liable to become narrower, and to produce absolute retention on any instrumental contact; and (2) any use of the instrument may produce in the patient an attack of rigors.

1. Let us consider first the mechanical causes of difficulty, of which the first is extreme narrowness.

In regard to this, the first thing you must do is to see the patient make water. The failures to pass the instrument may not necessarily have

arisen from narrowing of the urethra or from tortuosity; there may be a false passage in the canal. It may, indeed, be that there is no stricture at all. No greater mistakes are made than those which occur with patients who have little or no stricture, either from the surgeon not knowing well how to pass the instrument, or from there being a false passage into which it enters, so that it does not reach the bladder at all. You are first, then, to see the stream of water, perhaps on more than one occasion, so as to estimate it fairly, and you will judge by that what size of instrument is to be used. And always let the instrument correspond with the size of the stream which you see; but it should correspond only in this way—the instrument should be a little smaller. You will sometimes see a patient who scarcely passes a stream at all; the urine issues only in a succession of drops. This being his constant, and not a temporary or accidental, condition, how very small must be the instrument which is adapted in size to traverse fairly the stricture.

The first step to be taken with such a case, after having ascertained, as I assume to have been done, the situation of the stricture, is to introduce very gently the smallest English gum catheter without a stylet, and try to insinuate it through the obstruction. For this purpose I have endeavored to obtain some exceedingly small instruments, much smaller than any hitherto made.\* This tiny catheter, which I show you, containing a slender steel thread rather than a stylet, may be used either with or without it. The value of this little instrument, after its extreme tenuity, is its ability to transmit a drop of urine through its interior, and so assure you of its position when the bladder has been reached, an assurance, I need hardly tell you, of great importance. It is worth while making a careful and somewhat prolonged trial, and if you succeed, the instrument is to be tied in at once and the route secured. If I fail with this, I then try a silver catheter of the smallest size.

But there is one very important matter in relation to the silver instrument—namely, that it is an extremely dangerous one in inexperienced or in incautious hands. Nothing is easier than to implicate its slender point in a lacuna, and if the slightest force be used, the point leaves the route and finds a track among the loose tissues outside the urethral mucous membrane, and thus a false passage is commenced. If you cannot train your hand to employ it with extreme lightness and delicacy, by no means use it. It should be held and moved with so much tenderness, that if the point meets with any resistance in its course, the fingers rather should slip down the shaft than communicate pressure to the instrument. Any kind of force in its use is not to be thought of—its only value is in its capacity for being insinuated between closely applied surfaces, and any sense of opposition to its point is a clear intimation that its route may lie right or left, but not straight on. It is not fit for the hand of a tyro, but when he is habituated to the use of somewhat larger instruments, the ability to use this will follow. A careful trial, however, with the very small gum catheter, first without and then with the stylet, will in many cases make this unnecessary; but these failing, I know no instrument so valuable as a very fine silver one

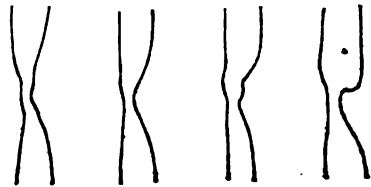
with a little increase of size in the shaft, to render it steady. The final three inches should not exceed half the size of No. 1 of the English scale; the shaft should gradually rise to fully No. 2.

2. A stricture may be more or less tortuous; in other words, it does not necessarily follow the exact direction of the urethra.

It may be a little on this side of the axis or on that, not necessarily in the middle. You may see this sometimes in the dead body; and you may infer it from experience on the living. When you have to deal with a very narrow or with a tortuous stricture, there are two quite distinct systems of using an instrument, either of which you may employ. What I have to say, then, applies to the manipulation necessary in all cases of difficulty under the present and preceding heads; and I have reserved it therefore until now. First, the little instrument employed, whatever its nature, may be applied by what may be called "groping"—that is, by carrying the point in any and every direction, with the utmost care of course, until by chance it has entered into the stricture, as you may feel by the sensation of the point being "held" or "grasped." For this purpose very slender solid instruments are made of gum-elastic, of catgut covered or not with gum, or of whalebone, since these can be produced of rather smaller size than the hollow instruments which I have just described. In order to add to the chance, as is supposed, of finding the orifice, there are some of the first-named material, the ends of which are formed somewhat into the shape of a corkscrew, or are otherwise made to deviate from a straight line. All these are of French design and workmanship, but none have the advantage of being hollow, to demonstrate their presence in the bladder when they arrive there.

Now, I advise you not to rely on mere groping to find the orifice; it is exceedingly dull, mechanical work to be constantly groping for a considerable time on the chance of success.

There is a method of search, however, conducted on a fixed principle, which I much prefer and always employ. I advise you to adopt that, or any other you can devise, provided that it be a systematic one, and also an exhaustive manner of making the necessary exploration and researches for the orifice of the stricture. Some of you have often seen me apply it to patients in the wards upstairs. According to this manner you proceed systematically and examine each side of the urethra *seriatim*. We will suppose the urethra to require examination on four sides—a roof, a floor, a right side, and a left side. You are to take your slender silver catheter and slide its point delicately along each side successively from the orifice to the place of obstruction. If the orifice of the stricture is not *exactly* in the middle line, and we may fairly believe that it rarely is so, then there is one side of the passage which will more easily lead into the narrow way than any other. These diagrams



will show what I mean. If I go down on this side

\* Messrs. Weiss and Son have taken great pains to accomplish this for me, and have produced some slender delicate instruments much smaller than No. 1, which have been of great service.

I shall probably not get into the stricture; but if I slide down gradually on the other I shall probably get the instrument in, because you see there is less obstruction on that side. Begin, then, by the roof. The roof is the firmest part, the least likely to furnish obstruction in the way of ducts or lacunæ, and by following it you will be most likely to carry the point in. The floor, on the contrary, is the softest, loosest, and most spongy part, and will be most likely to yield to the instrument and give way. If your first effort does not succeed, take the right side; if that does not do, take the left; if that fails, try the floor. If you are very careful you may make the attempt in this manner for thirty or forty minutes without doing any damage; but if the patient suffers, or if he bleeds, or if you are losing patience, give up the task, or you may make a false passage, and increase the difficulty considerably.

3. The existence of a false passage leading out of the urethra is another serious obstacle to the introduction of instruments into the bladder.

The principle which must guide your action here is to be very careful to avoid the side on which the false passage is. A false passage commences usually on the floor, and no doubt for a reason already mentioned—viz., the fact of the structures below being looser and more delicate than those above. When you examine a patient with a false passage, you may find the instrument passing to its very end, notwithstanding which no urine flows. Here the false notion of stricture at the neck of the bladder. When the instrument has thus passed, put your finger into the rectum, and you will know instantly whether there is a false passage; for, if so, there are only the coats of the bowel, which are very thin, between your fingers and the instrument, so that you feel it very distinctly; and very commonly not in the middle line, but rather to the right or to the left. But if the instrument is in the right passage, the whole thickness of the prostate, not always very considerable, is felt between it and your finger. It is almost always in the bulbous portion that the instrument leaves the urethra and gets under the prostate. What you are to do, then, is to withdraw the catheter two inches or so, pass it on again, keeping as close along the upper part of the urethra as you can, ascertaining by means of the finger in the bowel that the instrument is not passing into the old route. But when a false passage exists, it sometimes constitutes the chief obstacle to the introduction of an instrument, for, as I have before hinted, the stricture itself may be only inconsiderable. The size of the stream will help to determine this point; and if, so far from being a mere thread it has a volume equal to a No. 6 or 7 catheter, use a No. 5 silver one, so that you can guide it, and try each side of the urethra successively until you discover which it is that enables you to clear the orifice of the false passage. Remember the result, and you have a key to the difficulty which will enable you to overcome it with ease on the next occasion.

4. Difficulty presented by dilatation and reticulation of the urethra behind the stricture.

Suppose next, that, following these hints, you have carried the instrument through the stricture; there is a sort of grasp felt on attempting to move the instrument which is quite unmistakable. But that very "grasp," which you are so satisfied to feel, makes it less easy to manipulate the point of

the catheter after it is through the stricture, and you may have a source of danger to encounter in the urethra beyond. Thus the mucous membrane, being sometimes reticulated from the presence of dilated lacunæ, it is easy to engage the point of the instrument in one of these, and make a false passage. Besides this, as the result of long continued fluid pressure and straining, the urethra behind the stricture is occasionally much dilated, and the whole surface is so irregular that it requires care and an acquaintance with this condition to traverse it safely. Here especially, with a small instrument already firmly grasped, you may require all the caution you can command in completing its safe course into the bladder.

The consideration of the difficulties which are not mechanical must be deferred to another meeting.

## PART OF

# A Clinical Lecture

ON

## INTERNAL URETHROTOMY,

AND ON THE INSTRUMENTS EMPLOYED FOR PERFORMING IT.

*Delivered at University College Hospital on November 29th, 1875.*

By Sir HENRY THOMPSON,

Surgeon Extraordinary to H.M. the King of the Belgians;  
Emeritus Professor of Clinical Surgery in University College Hospital.

(Reported by Mr. G. BUCKSTON BROWNE.)

THERE are various ways in which the operation of Internal Urethrotomy for Stricture may be done, and there are numerous instruments for the purpose. There are two different principles of action in making the necessary incision, and the instruments may be grouped in two classes by this means.

I. The stricture may be cut from "before backwards" on a guide previously passed.

II. Or a blade may be introduced through and beyond the stricture, which is then cut from "behind forwards," in which case a guide is unnecessary.

Before considering these, I may state that the situation of a stricture is an important element in relation to the applicability of internal urethrotomy of any kind, and also as to its necessity as a mode of treatment. Thus:—

1. A stricture at or near the external meatus is always extremely undilatable, while at the same time it may be divided with the greatest ease, precision, and safety.

2. A stricture existing in any part of the anterior three or four inches of the urethra partakes, but in a somewhat less degree, of the intractable quality named, and may be cut with almost as much facility and safety as those in the previous class. As a rule, it may be said, the nearer a stricture is situated to the orifice of the urethra,

the more necessary it is to cut, and the safer it is to do so.

3. Strictures in the bulbous portion of the urethra, which may be considered as generally ranging between four inches and five inches and a half from the external meatus, are less liable to be unmanageable by dilatation than those of the preceding classes. But when necessary to cut them, it is easy and quite safe to do so as a rule, slightly less so than those in the preceding class; the difference being due, no doubt, to the larger amount of erectile tissue there as compared with the anterior part of the urethra. Bleeding, therefore, may be more considerable, and other risks, such as they are, more liable to be encountered.

I show you urethrotomes in great variety here, chiefly of French make, the operation having been largely practised in France long before it was employed here. Modifications innumerable of what were originally simple, perhaps we may say rude, instruments, have been made during the present century in that country, and more recently elsewhere. Most of those known by the names of Leroy d'Etiolles, Civiale, Amussat, Reybard, Ricord, Trélat, Sédillot, Maisonneuve, Stafford, and others, are before you; there is one also, a recent one, of Dr. Otis, which, like Reybard's, distends the passage at the same time that the incision is made.

I select two as types of the two different systems described of using a cutting instrument—the urethrotome of Maisonneuve and that of Civiale. I select the former instrument because it is not only a type of one which cuts from before backwards, but because it has been more largely and generally employed of late years on the Continent perhaps than any other. The instrument of Civiale I have selected because it is the typical one of the other system—viz., that of dividing the stricture from behind forwards.

The urethrotome of Maisonneuve consists of a slender guide or conductor in steel, the size and nearly the form of a No. 1 or 2 catheter, but grooved throughout its course. This is first introduced through the stricture into the bladder. Along this groove slides a blade of triangular form, the base of the triangle being attached to a long steel wire, while the two other sides of the triangle project considerably. This blade can be pushed, by means of a handle attached to the wire, through the whole course of the urethra. (See Fig. 1.) The apex of the triangle, which is the salient part,

quires treatment by incision. It is an axiom accepted by most, if not all, who have carefully observed the results of urethrotomy by any method, that if an incision of stricture is required at all, it is essential that the whole of the obstructing fibres should be divided. No one laid more stress on this doctrine than Sympson, of Edinburgh, after he had had a considerable experience of his method by external division. The cases of relapse after that operation he had no doubt were chiefly those in which he had cut insufficiently and left a few fibres undivided. The justice of this observation was verified repeatedly by myself then, and also since, in my own practice, with internal urethrotomy. Now, what happens with Maisonneuve's instrument? The blunt apex, which enables the blade to pass without injuring the healthy urethra, fails to cut the most elastic or yielding fibres of the stricture, which, by reason of their yielding character, permit the blade to pass through by stretching them. The blade incises, no doubt, the strongly marked and hardest portion of the stricture, but all the obstructing tissue is not divided, especially that for some distance before and behind the maximum point of narrowing, and these uncut fibres will at no distant period of time show their presence and reproduce contraction. Further, by no manner of using the instrument can you control or regulate its power. It is a mechanical apparatus or machine, which just accomplishes a certain amount of action and no more. This alone is for me a serious ground of objection to any instrument.

Now, suppose for an instant that it were possible for you to have the stricture before you open to your eyes and hands; you certainly would take a little scalpel and employ it for each case according to its needs, intelligently dividing the obstructing fibres as much as is necessary, and no more. But with a very little practice it is perfectly easy to do this without seeing the stricture—that is, to apply a little scalpel, dividing where you wish and not elsewhere, just as you divide the constricting fibres at the ring of a hernial sac. And I need scarcely say that this intelligent action of yours will produce something better than the work of a machine which any ignorant person can employ just as well as you. The difference in the two cases resembles that which exists between the music of an organ produced by a handle, and the music which results from the facile hand of a skilled performer.

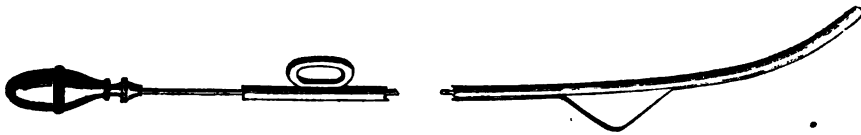


FIG. 1.—The Urethrotome of Maisonneuve.

is blunt, and the lower side of the triangle only is sharp and will cut. In the act of passing the blade, the healthy part of the urethra is protected from incision by the blunting of the apex (like the button of a foil in fencing), while the sharp side divides certain of the hardened tissues which it meets.

Now, my objection to this instrument is simple and distinct, and I do not hesitate to say is fatal to it in respect of its efficiency for a case of confirmed and indurated stricture, such, indeed, as constitutes that form of the disease which most re-

quires treatment by incision. It is a question of no mean importance which arises from the comparison of incision made by machinery and incision made by the intelligent hand. That is the real question in urethrotomy as presented in these two systems. And the instrument I now show you, which I always use, and have operated with so many times in the wards here, is the type of the method which affords the opportunity of making the incision according to the operator's will and judgment. It is nothing more than a little knife with a long handle, and is used precisely as we use a scalpel anywhere else,

Just as we should use a small knife in tenotomy, without the sense of vision, where it is not necessary, but guided by the sense of touch, so do I advise you to cut in urethrotomy. I carry the parallel one step further, and remind you, that just as it is essential in tenotomy to divide completely the tendon, and also any little minor band of constricting tissue which opposes the perfectly free play of the joint, so is it essential to make the same complete division also in urethrotomy. The ultimate success in either operation depends on attention to these particulars.

The instrument which I hold in my hand, and

catheter tied in, which produces scarcely any inconvenience; and thus by "continuous dilatation" you can always bring the most resilient stricture to the required size for the operation. Having arrived at No. 8, you are enabled to perform the operation in the best possible circumstances. And the few quiet days spent in preparation are advantageous rather than otherwise; the result furthermore being that you can now make an incision in the manner I have described, directed by your intelligence and adapted to the particular case.

For safety to the patient and excellence in re-

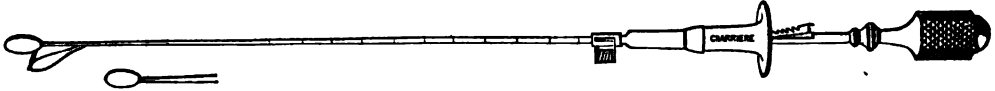


FIG. 2.—The Urethrotome of Civiale.

to which I have been referring, is the urethrotome of Civiale, made much smaller, as I prefer it to be, than is customary in Paris. The shaft of mine is about the size of No. 8 English scale, with an oblong bulb at the end not larger than No. 5 or No. 6. Within this is a little blade which, by a clever contrivance, the operator can make to issue at will, as much or as little as he desires, and which he can also sheath instantly at his pleasure. The bulbous end gives him the power of exploring the urethra at the time of the operation, and of determining precisely where and what he ought to divide. (Fig. 2.)

The bulb is to be introduced, say fully half or three-quarters of an inch beyond the maximum point of narrowing felt, the blade is then to be projected there, and drawn steadily through the whole of the constricted portion outwards towards the meatus, in which direction the incision is sure to be certain and complete.

Now I at once anticipate an objection which I expect you all to raise. I expect you instantly to exclaim, "Why, if an instrument so large as No. 6 can be passed through the stricture, should there be any occasion to cut at all? Surely it is for small strictures, through which only the finest instruments can be passed, that an operation is necessary, and for such this instrument of Civiale is obviously unfitted by its size!" Such criticism is quite natural at the first glance, and from those who have not learned by considerable experience certain important facts about confirmed stricture.

I reply, first, that the *narrowness* of a stricture alone, however extreme, does by no means render a cutting operation *always* necessary. Some of the narrowest strictures I have ever seen have been very successfully and rapidly treated by simple dilatation.

Secondly, the quality which makes incision of a stricture necessary is, as I have previously shown, "resiliency"—that property which leads it to contract again rapidly after any dilatation. This quality affects strictures which will admit No. 5, No. 6, or No. 7 quite as frequently as narrower contractions.

Thirdly, supposing it is necessary to cut a stricture which is narrow and only admits No. 4 or No. 1, there is *never any difficulty in dilating it temporarily* up to No. 6 for the purpose of admitting the instrument I recommend.

All you have to do is to keep the patient in his room from three to five days with a small soft gum

sult, both in regard of his present and future condition, I greatly prefer the operation I have described to any other method I have ever seen.

PART OF

## A Clinical Lecture

ON

### SOME IMPORTANT POINTS IN CONNEXION WITH LITHOTRITY.

*Delivered at University College Hospital on Dec. 6th, 1875.*

By Sir HENRY THOMPSON,

Surgeon Extraordinary to H.M. the King of the Belgians;  
Emeritus Professor of Clinical Surgery in University College Hospital.

(Reported by Mr. G. BUCKSTON BROWNE.)

THERE are two or three subjects in connection with lithotripsy to which I particularly desire to call attention, since they are the result of increased experience in relation to that operation; and I wish to make them prominent because I consider them extremely important with regard to successful practice. I find that those who are unacquainted with the progress which lithotripsy has made of late years, and who know it only as it was practised some fifteen or twenty years ago, reproduce the same old objections with which we were so familiar then, or speak of it with the same "faint praise" which was then so current. I do not mean to say that any striking novelties in the instruments or in the system of operating have been recently achieved. The mechanical procedure has probably long been too nearly perfect to permit us to expect results of that kind. But insensibly, as the result of experience and careful observation, modifications of practice have gradually taken place, which have increased the success and improved the after-results, I do not hesitate to say, at least very considerably. What these are I will endeavor briefly to illustrate.

1. The first principle I wish to inculcate in connexion with the management of patients during

lithotritry is, that it is desirable to treat any cystitis that may occur during the course of the sittings, especially if it is severe, by freely crushing the stone without delay. I have for some years insisted on the importance of this practice in my teaching. I believe that in this country its value has long been to some extent recognised; but the more I see of the operation, the stronger is my conviction of the great importance of this practice, and the more ready I am to adopt it. Abroad, cystitis is more generally treated by baths, diluents, low diet, and medicine; and the next sitting is postponed until the patient may be, as it is said, in better condition for the instrument. The surgeon fears the effect of introducing a lithotrite into the inflamed bladder, lest the disturbance should increase the inflammation—a result which it appears at first sight not unreasonable to expect. Now the precisely contrary effect is that which occurs. For example, I crush a uric-acid stone once; or it may be twice, with two or three days' interval between. In thirty-six or forty-eight hours after the sitting the pain and frequency of passing water become considerable, the urine is loaded with muco-purulent matter, and it assumes a full-red tint. Some slight febrile condition may or may not be apparent in the patient. Under these circumstances I place him under the influence of ether, crush freely all the large and sharp pieces, and wash out the debris with Mr. Clover's aspirator. Six hours after the urine is much clearer, the muco-pus has almost disappeared, and the patient's general condition is greatly improved. This will happen certainly in nine out of ten of the cases described. I have had the opportunity of demonstrating this to many of my foreign brethren, who are invariably struck with the result. The fact is that the cystitis in these cases is purely a traumatic one, that it is due to the injurious effects of the sharp, hard portions of stone which lie in continuous and close contact with the mucous lining of the bladder, the result of which is that incipient ulcerative action takes place. Crush and remove these, and that instant repair commences, inflammation is rapidly diminished, and the patient is no longer in danger, but is greatly relieved. Even simply changing the situation of the large pieces in the bladder is followed for a few hours by manifest improvement, showing in what manner their presence is injurious. If some large pieces still remain after the fresh crushing, the former symptoms of cystitis reappear in two or three days, and may be again relieved by another sitting, this time probably altogether or nearly so, as a succeeding crushing will, no doubt, dispose of the principal part of the stone, and leave at all events no considerable fragments. This practice has, moreover, an important relation to the after-condition of the patient, as we shall see by and by.

On the other hand, let us suppose a case of lithotritry in which all goes well with the patient, and no fever, no cystitis, &c., happen; still the interval between the sittings should be short, not more than two or three days. You take advantage of the tranquil state of affairs to proceed steadily and carefully, not tempting fortune, but without a day's unnecessary delay. But if cystitis appears you are, as already advised, still less to lose time; and so in either event the operation of lithotritry is soon completed. I rarely exceed now fourteen or

sixteen days as the full term which includes all the sittings. Often eight, ten, or twelve suffice.

This practice is no doubt facilitated by the recent improvements in anaesthesia. I have never, as you know, been very well disposed towards the employment of chloroform for any purpose when it could be dispensed with, but I have of late, mainly owing to the improved methods of producing anaesthesia, availed myself of it much more than formerly. I refer to the system which Mr. Clover always pursues, of administering first nitrous oxide for about thirty seconds, and then following with ether vapor. The rapidity and greater safety of the process as compared with that by chloroform, together with the freedom from subsequent sickness usually attained (the latter an advantage of no slight value), have influenced my practice, and I now make anaesthesia the rule and not the exception.\* Consequently, also, I avail myself of the opportunity to do a larger amount of crushing than I did when the patient was conscious—a course which, while it is permissible or advantageous in practised hands, is not to be necessarily recommended to the young operator. To him, now as ever, I repeat that success can only be obtained by the greatest caution and prudence. He must not be tempted to introduce the lithotrite so frequently as he sees that I sometimes permit myself (especially in cases of cystitis requiring immediate relief) to do. I still advise you to be content with two, at the most three, introductions of the instrument at a sitting, and thus much only if you are able to make them with tolerable facility.

2. The second principle which is to guide your practice in lithotritry is the importance of detecting at all stages of the procedure any inability on the part of the patient to empty his bladder by his own efforts. Let me say at once that a very little negligence in relation to this matter is the chief cause, beyond all question, of the subsequent troubles which occasionally become evident at an early period after the stone has been removed, and which have constituted, in a certain proportion of cases in elderly men, sources of discredit to the crushing operation. In the cases referred to, the calculus is often removed easily enough, little or no trouble occurs during the procedure; but it becomes evident afterwards that the frequency of passing water is not remedied, and small pains and discomforts continue. The patient leaves his surgeon, and reappears in a few months or even weeks, with clouded, perhaps alkaline, urine, depositing triple phosphates, and with other symptoms more marked than when he left. My friend, Mr. Cadge, who has been reporting of late his valuable experience in relation to this matter, regards these phenomena as not unfrequently due to the escape of a small fragment into a sacculus in the bladder, where it becomes the source of irritation, phosphatic deposit, and occasions the formation of a fresh vesical calculus, with ceaseless discomfort and repetitions of crushing for the patient. I agree with him that this sometimes happens, having had, like him, ocular and other demonstration of the fact; but I have no hesitation in

\* Mr. Clover has employed this method, more or less, for me now about two years and a quarter, and for the last year and a half has done so without exception, using no chloroform whatever. In reply to my inquiry, he writes me that he has during this period administered the gas and ether for me two hundred and thirty times for lithotritry.



saying that in the large majority of cases this is not the cause, and that, happily, it is due to another cause, one that is in a very great degree preventable. These after-troubles will appear in patients who have had very little uneasiness antecedent to the operation. Their stones have been small, and their bladders have been in excellent condition; no ground, therefore, can exist for supposing such a patient to be the subject of sacculus in the bladder. Every presumption, indeed, is opposed to that view, because sacculi, as a rule, do not form without the existence of an obstruction to the outflow of urine, which has been in operation for some long period of time.

Now the particular fact which I am going to state is one I was scarcely aware of five years ago. I have long been aware of the necessity of watching carefully for inability to empty the bladder during lithotrity, have long also spoken of the insidious manner in which that inability commences, and pointed out that it must be dealt with by the habitual use of the catheter. But I have only learned during the last few years how extremely small a quantity of urine habitually left behind in an elderly patient's bladder after each act of micturition, provided that he is undergoing, or has just undergone, lithotrity, suffices to lead to phosphatic deposit and to chronic cystitis. You will scarcely believe me that one drachm, or one drachm and a half, only of this residual urine is enough in most such cases to produce the condition so feared and detested by every lithotritist;\* and I now add, that if the condition is detected early, and this small quantity is promptly and frequently removed by the patient himself, which he can easily do with a soft *coudée* catheter, almost certainly the dreaded symptoms will not appear.

I have been surprised at the result; not less surprised than I have been at the fact that the patient, who towards the close of lithotrity, or afterwards, is making urine every hour or so, and who, on passing his catheter, finds only one or two drachms behind, often obtains at once an interval of three hours or more. Such a one should pass his instrument at least three times a day until he regains the power to empty the bladder completely by his own efforts. I confess that formerly so small a quantity of urine did not seem to me worth the trouble of removing; as I assumed, on theoretical grounds of course, that it could not be of any importance. I now know that the practice of removing it constitutes for many cases the difference between a permanent success and an ineffectual result and painful future.

Now then, how does the plan of crushing for cystitis, referred to under the preceding head, affect, as I said it would, also this important question which we are now discussing? Thus: it is precisely in those cases where the treatment has been prolonged, or where cystitis, either acute or chronic, has been allowed to go on unchecked, that the inability to empty the bladder is most likely to occur. Again, this inability, once commenced, very rapidly becomes the established order of things in elderly people, unless it is checked at

the outset. Once let the bladder be accustomed to the smallest degree of accumulation of urine, and the power to empty itself entirely is, after a certain age, often permanently lost. The best chance of preventing this, and the phosphatic deposit which results, is, in the first instance, to avoid or cut short cystitis during the treatment by lithotrity in the manner described; and, secondly, to teach the patient to empty his bladder himself towards the close of the operative proceedings or immediately after, if the smallest failure to empty it is detected. Once for all, let me say, I cannot exaggerate the importance of these recommendations.

Now, when this tendency to produce phosphatic deposit has been unfortunately established, we are often able to benefit the patient by teaching him to wash out the bladder, by means of an ordinary catheter and bottle, with weak acetate of lead, nitric acid, &c. But of late I have adopted another method, with manifest advantage. I advise the patient (who may or may not be habitually using the catheter to empty his bladder) to use every second or third day the following apparatus:—

(1) A black flexible catheter, No. 11 or No. 12 in size, made thin, and with polished interior, so as to facilitate the passage of debris through it (a great improvement on the ordinary French flexible catheters, which are thick and have often rough interiors), and having a large oval eye on the upper surface of its extremity, which is slightly turned upwards (*coudée*). See Fig. 1.

FIG. 2.



FIG. 1.—The catheter described. The actual measure of the drawing is No. 9. It will be understood that the size indicated is usually No. 12.

FIG. 2.—B, The nozzle of the bottle, which fits over the end of the catheter, A.

(2) An eight ounce india-rubber bottle, with a brass nozzle which fits over the outer end of the

\* It is not to be supposed that I regard so small a quantity as equally important in a patient whose urine is clear, who is not the subject of any chronic cystitis, and who is not undergoing lithotrity. In an elderly man the presence of a drachm or two of "residual" urine suggests that at some future time he may require the catheter, but certainly it would not yet be necessary.



catheter, and not into it. The manifest result of this mode of attachment is, that a powerful uninterrupted current can enter and issue from the bladder; indeed it is scarcely possible that debris should remain in the organ under the influence of the action of this apparatus, as anyone can perceive on using it. It may also be used as an aspirator, with a backward and forward current, if desired. (See Fig. 2.) For the patient's own use it is even more easy than the ordinary four ounce bottle, which I have long been in the habit of desiring such to apply, since the size and freedom of the channel—not narrowed at the point of contact between bottle and catheter—permit the fluid to be propelled with very slight pressure.

There is still one admirable remedy for that low chronic cystitis which is associated with the production of phosphatic calculus in the bladder—viz., the injection, every day or every other day, for a short time only, of a very weak solution of nitrate of silver. About half a grain to four or six ounces of distilled water is amply strong enough; and one or two injections sometimes suffice, in these circumstances, to produce a very notable diminution of the muco-purulent secretion.

## Original Papers.

### PROGRESSIVE MUSCULAR ATROPHY.

By WILLIAM ALEXANDER, M.D.,

Visiting Surgeon; and

A. M. S. HAMILTON, M.D., M.R.C.S. Eng.,

Senior House-Surgeon to the Liverpool Workhouse Hospital.

The following cases of progressive muscular atrophy were under observation for a considerable time. In one case death occurred, and was followed by an exhaustive microscopic examination of the cord, &c. The last case simulated this disease for some time, and, we think, may throw some light on its pathology.

We publish these cases the more confidently as Dr. Lockhart Clarke kindly examined specimens of the cord submitted to him, and he agrees with our description of the lesions that have taken place.

CASE 1.—E. N—, aged forty-eight, single, a servant, who has generally been employed washing floors, was admitted into the Liverpool Workhouse Hospital on March 18th, 1873.

*Family and previous history.*—None of her relatives suffered from any form of paralysis. She cannot attribute the disease to any special cause. She does not remember to have ever received any injury, nor at any time to have been exposed to severe cold. In 1872 she first felt a sensation as of "pins and needles" in the ends of the fingers of the left hand. This was followed by weakness of the thumb and afterwards of the fingers. Subsequently the right hand became similarly affected.

*State on admission.*—The left thenar and hypothenar eminences have completely disappeared. There are well-marked depressions corresponding to the interosseous spaces between the metacarpal

bones. The first and second phalanges are flexed; the proximal phalanges extended, or, in other words, there is partial *main-en-griffe*. There is wasting of the muscles of the forearms, especially on the flexor aspect. The movement of the parts involved are diminished in proportion to the wasting. She cannot move either the fingers or the thumb, but she can to some extent move the wrist. Sensation in the affected parts is normal. She suffers from neuralgia in the left shoulder. There is no fibrillary tremor. General health good.

*Treatment.*—Easton's syrup, shampooing, and the constant current.

During the next six months she improved steadily: she became stouter, the atrophied muscles of the thumb and little finger increased in bulk, she could move the fingers slightly, and she had lost the desponding look that was noticed on admission. Next winter her general health continued in much the same state. Her hands became very susceptible to cold, which was remedied by wrapping them up in cotton-wool. The disease seemed to be at a standstill. In the spring of 1874 she had an attack of bronchitis, during and after which attack the disease recommenced, and soon reduced the general and local symptoms to the state described on her admission. Her speech became affected, as shown by a peculiar hesitancy or difficulty, as if the muscles of the jaws were stiff and would not readily obey the commands of the will. She now complained of a weakness in the muscles of the back and legs, and an inability to stand or walk more than a few minutes at the time. Towards the end of the summer of 1874 she had some difficulty in swallowing, and on one occasion she was nearly choked whilst eating her dinner. In the ensuing autumn another attack of bronchitis came on, to which she succumbed in a few days. For a short time before her death her respiration was almost diaphragmatic, the external inspiratory muscles being very feeble. This was seen by the abortive and painful attempts she made during her last illness to get up the sputa that were suffocating her.

*Post-mortem examination.*—The legs did not show any wasting of special muscles. They were wasted generally in the same way as after phthisis or any other wasting disease. Unfortunately her urine was not examined during life, as there were no symptoms pointing to disease of the kidney; a specimen obtained after death contained hyaline casts and albumen. The cerebro-spinal axis did not present any evidence of disease. The spinal nerves at their exit from the cord showed no sensible diminution. The muscular tissue of the left thenar eminence had apparently disappeared, a small quantity of areolar tissue occupying its place. The muscles of the left forearm were pale, the deltoid very pale and atrophied. The right thenar eminence showed some muscular fibres. Diaphragm seemed healthy. Kidney a little reduced in size; capsule adherent in some places; the surface of the organ presenting elevations and depressions similar to but smaller than those seen on the rind of an orange. Muscular tissue of oesophagus very pale and easily broken up. Heart normal in size and appearance. Liver slightly fatty.

*Microscopic examination of cord and muscles.*—In the cord the following lesions were observed:—1. Atrophy of the cells, both of the anterior roots and of the postero-lateral columns in the cervical region. 2. Atrophy of the cells in the

anterior cornua in the dorsal region, and granular degeneration of the cells of the postero-lateral columns of the same region; the degeneration of the postero-lateral columns not being so far advanced as in the cervical region. 3. Atrophy of the majority of the cells of the anterior cornua in the lumbar region, although we have found cells much more perfect than in any of the other regions. Here the cells of the postero-lateral columns are the most perfect in the cord, the degeneration being confined to the nerve-processes. 4. A dilated state of the bloodvessels, with hypertrophy of their coats throughout the cord. Around some of them was a granular semi-translucent material; around others a clear space from which this material may have fallen out. A large dilated bloodvessel on each side of the central canal could be seen throughout nearly all the extent of the cord. 5. The central canal was dilated at parts, and was everywhere filled by irregularly square-shaped cells, filled with granules, in most of which a nucleus could be observed. Here and there a small vessel could be seen amongst the cells. 6. That there seems to be more atrophy of the commencing anterior roots in the dorsal region than in the cervical region. In the affected muscles we found various stages of granular degeneration. In those least affected the striations were perfect, and a few scattered granules was the only change visible. The next stage seemed to be a confusion and obliteration of the striations, and a gradual increase of the granular material. The next change consisted in the fibres becoming varicose; the varicosities in a further stage had ruptured, whilst the sarcolemma remained as thin fibrous cords in the midst of the granules.

CASE 2.—J. M., aged thirty-six, a shoemaker, single, was admitted into the Liverpool Workhouse Hospital in August, 1878.

*Family and previous history.*—Father and mother died of old age; one brother died of phthisis and another of some other disease the nature of which he does not know; two sisters still alive; no history of paralysis in the family. In his earlier years he enlisted as a soldier, was sent to India, where for seven years he drank heavily, chiefly ale and rum. During that time he suffered from ague and Asiatic cholera. Since the attack of cholera he thinks his muscular development has not been so great as before, but he did not at that time observe any loss of power. Had gonorrhoea twenty years ago; never had syphilis. In 1866, when stationed at Dover, he had a fall of sixteen feet from a scaling-ladder, his back coming into contact with the ground. He was not hurt, and he has thought no more about it since. In the beginning of 1871, when intoxicated, he slept a night in an open boat. A few days after he felt the thumb of the right hand cold and numb; this was followed shortly after by some loss of power, so that he was obliged, in cutting leather, to cut *from* instead of *towards* himself, and thus use his wrist in place of his thumb. The sense of chilliness and of loss of power extended up the forearm, so much so that he was obliged at intervals to give up work in order to warm his hands at the fire, after which he could work better. The ball of the thumb then began to waste; the chilliness and loss of power extended further up the forearm, compelling him to assist the right arm with the left in dressing himself. At the end of nine months the disease had reached the shoulder. He is very clear

and decided in his statement that the feeling of chilliness always invaded a new region before the loss of power. On account of the warmth he was accustomed to walk with his right hand in his pocket, having to put it in or take it out by means of the other hand. From the shoulder the disease invaded the neck. He soon became unable to keep his head erect without artificial aid. This he generally accomplished by resting his head against the wall. From the shoulder the disease went *down* the left arm, invading first the shoulder, then the arm, forearm, and hand in succession. He is certain of this, as he remembers at one part of its course when, after propping the forearm on the table, he could button his vest with ease, his fingers retaining full power, and at a time when he could not flex his elbow nor raise his arm. It took the disease four months to go down the arm. About the beginning of 1878 he observed that he had lost control of the right foot; he could not put the heel to the ground, and he missed the elastic "spring" that he formerly had in walking. In a few weeks the left leg and foot became affected similarly to the right, the patient being obliged to walk on his toes, as he says, to prevent his falling backwards. His sight has always been good. Has had a pain in his back for the last four months, and for the same period has been troubled with headaches.

*State on admission.*—The patient has a very peculiar appearance; his face is shrunken and emaciated, except where the masseters, which do not seem to be effected, stand out in relief; his head is thrown back; his arms hang helplessly by his side. To describe his appearance more particularly, the thenar and hypothenar eminences in each hand are completely wasted, the fingers flexed, the interosseous spaces hollowed out from loss of the muscles, and the arms wasted, and only retaining the shape given to them by the bones. Both pectorals are wasted, but especially the part that takes origin from the clavicle. The supra- and infra-spinatus are also affected. On turning the patient round, the trapezius is seen to be considerably atrophied. The legs are not nearly so much affected, and the thighs not at all. When the arm is raised at right angles to the shoulder, he can draw it backwards and forwards by the latissimus and pectoralis major muscles respectively. In walking he inverts the foot, depresses the toes, at the same time swinging the leg forward by means of the muscles of the pelvis and thigh, thus bringing his toes first into contact with the ground. He is unable to sit for more than half an hour in the erect position. Sensation, although defective, is nowhere entirely lost. The patient, in regard to it, states that when first attacked he could feel the awl with his fingers much better than he could with his thumb. He often saw a "flickering" in his muscles as if "something was moving under the skin," but no fibrillary tremor was observed whilst he was under observation. His appetite is fair, bowels regular, and his intellect quite clear. His powers of observation are remarkably good, as shown by the intelligent account he gave of his disease, and of the onset of the various symptoms. No albumen in urine.

Easton's syrup in drachm doses three times a day, with the application of the continuous current, were prescribed.

Patient remained in hospital for several months. He went to Ireland and has not been heard of.

*State at time of discharge.*—The nutrition of the muscles of the neck and head is considerably improved. He can hold his head erect for some time without fatigue, and he is able to throw his arms about in a much more vigorous manner. The movements of the muscles of the forearm are almost in the same state as they were on admission.

The interrupted current was used for some time, but it did not seem to have the same beneficial effect as the continuous one.

CASE 3.—W. S—, aged thirty, a sailor, was admitted into the Liverpool Workhouse Hospital on the 8th of April, 1874.

*Family and previous history.*—Patient is not aware that any of his relations suffered from paralysis or from any form of nervous disorder. For the last fifteen years he has sailed to India, China, and Japan, during which period he drank heavily. There is no history or symptom of his ever having had syphilis, the only disease he remembers suffering from being typhus. Two months and a half ago, while at sea, his bowels became obstinately constipated, which constipation lasted but a short time. He dates his present illness from this period, as soon after a pain of intermittent severity was experienced in the "small of his back," accompanied with some loss of appetite. A little more than a month previous to admission, on one occasion, whilst crossing the Atlantic, he was exposed to severe cold. Next day he felt that his arms were "stiff," and that the pain had extended from the "small of his back" to his shoulders and chest, and that it was much increased in severity. During the succeeding week loss of power and gradual wasting of the arms and shoulders ensued.

*State on admission.*—His face has the appearance of a healthy, robust, and weather-beaten sailor. His bowels are regular, his appetite good, and his tongue clean. Neither his history nor his appearance showed any evidence of the existence of lead-poisoning. On the patient being stripped we were at once struck by the great wasting of the muscles of the chest and of both shoulders, especially of the right. On examining the right shoulder more closely we found that the wasting affected the great pectoral, deltoid, supra-spinatus, and infra-spinatus muscles, the biceps and triceps apparently retaining their normal size. There was some wasting of the flexors of the forearm, and the thenar eminence had disappeared. There was a slight and appreciable wasting of the muscles of the hypothenar eminence. On exposure to cold the wasted muscles presented a fibrillary tremor. The deltoid muscle seemed to have a little power left, as he could raise the arm about three inches from the side. There was no apparent wasting or loss of power of the trapezius. He could both elevate and shrug his shoulders. Pronation and supination, although weak, were perfect. He could not circumduct his thumb nor bring it into apposition with the little finger. When told to button his vest with the right hand, he would endeavor to do so by jerking his shoulders and body first backwards and then forwards. His arm was thus thrown across the front of the body, and, if his fingers managed to catch the button, they for a moment made a futile attempt to complete the act, but as soon as the impetus that placed the arm in that position had ceased, the arm dropped again to the side, the feeble fingers that grasped the button being unable to support the weight of the limb. The left arm presented the same appearance to a

less degree, and the loss of power was proportionally less. The patient thinks that the disease commenced in both arms at the same time, but that in the left it progressed less rapidly than in the right arm. There is a slight hesitancy of speech, which patient says did not exist before the disease began, and he complains of a huskiness of voice. Urine: sp. gr. 1021; no albumen.

*Treatment and progress of case.*—Patient was ordered Easton's syrup, a drachm three times a day, shampooing, and the application of the constant current twice daily. On April 28th, twenty days after admission, he left the hospital in the following condition. Both thenar eminences were increased in size and in power, the flexors of the forearm and the muscles of the shoulder showing a slight but decided improvement. The pains in the loins and shoulders had completely disappeared.

CASE 4.—P. H—, aged sixty-one, corn-porter, married, admitted into the Liverpool Workhouse Hospital March 6th, 1875.

*Family and previous history.*—He believes that none of his friends had suffered from any nervous disease. He had ague twenty-five years ago. When a young man he got intoxicated at least once a week, but for the last seven years he has been comparatively sober. The muscles of the thumb and little finger were subjected to daily pressure for many years past in turning the handle of a windlass, and he had sometimes to lift pretty heavy weights. No history of injury. In 1869 he first noticed a numbness in the fingers of the left hand, most marked on, and for some time after, awaking from sleep. This continued with intermissions till 1871, when the hand became weak. He could not grasp the bags with the same power as formerly, and, on looking for the cause, a distinct diminution of the "ball of the thumb" was seen. The right hand became impaired in the same way, but he could not give any reliable details as to the time of the onset of the symptoms.

*State on admission.*—Complains of a feeling of "pins and needles" in the points of the fingers of both hands, the feeling being increased by cold. He has pain in the left shoulder. The right thenar eminence is wasted, and there is some wasting of the interosseous spaces of the metacarpal bones on the palmar aspect; the left thenar eminence is less wasted than the right; no wasting of the other muscles of the body. He cannot circumduct the right thumb, nor apply its tip to that of the little finger. He can shut the fingers of the right hand with very little force, the middle finger possessing a little more power than the others. In the left hand he can touch the little finger with the point of the thumb, and can circumduct the thumb feebly. Appetite and general health good. Urine: sp. gr. 1022; no albumen.

*Treatment.*—Easton's syrup, shampooing, and continuous current. On June 1st a prominence of left acromion process was observed, which was found to be due to wasting of deltoid. Fibrillary tremors were now observed for the first time. The muscles of the hand are improved both in bulk and in the power of motion. He can now approximate the right thumb to the little finger. Patient took his own discharge towards the end of June, his general and local conditions steadily improving.

CASE 5.—James R—, aged thirty two, laborer, single, admitted into the Liverpool Workhouse Hospital Feb. 15th, 1856.

*Family and previous history.*—No evidence

of any hereditary disease. Parents long-lived, neither of them dying of paralysis. Fifteen months ago, in lifting some iron castings, he felt a severe pain in his back, about the middle dorsal region, which "came and went" for three months, when it became constant, and extended to the left arm. Five weeks before admission he felt a tingling and loss of power in the fingers of the left hand.

*State on admission.*—Patient has a pale and anxious expression of countenance; pulse 80; appetite bad; tongue furred. There is no difference in the size of the arms; left forearm a little below elbow is nearly an inch less in circumference than the right; wasting seems general, and there is no proportionate diminution in power; left thenar eminence wasted, soft, and flabby. He cannot approximate the left thumb to the little finger; the fingers are partially flexed, and the power of grasping with the left hand is very feeble compared with the right.

*Treatment.*—Same as in the other cases.

Up to the 29th of March he remained in almost the same condition. On this day he complained very much of his back, which had been examined before, but nothing had been observed. A tumour was now seen extending from about the sixth cervical to the third dorsal vertebra. It was distinctly fluctuating, and could be pushed upwards and downwards beneath the muscles without causing much pain. He complained now of loss of power in his legs, so much so that he could not get out of bed. When the right leg is pinched he says he is "tickled"; when the left, he feels pain. There is numbness in the legs and body as far up as the lower margin of the ribs; no feeling of constriction round the body; bowels constipated; pulse 120.

April 6th.—Loss of power of right hand; total loss of movement in left hand; difficulty in passing water; temperature 102° F. Incontinence of urine and faeces set in shortly after; and for some hours before his death, which occurred on April 15th, he was delirious.

*Post-mortem examination.*—An abscess was found resting upon the right laminae of the last cervical and the upper three dorsal vertebrae, and penetrating between these laminae into the spinal canal. The periosteum of these bones was destroyed, leaving them rough and bare, bathed in the surrounding pus.

On account of the extremely softened state of the cord it could not be hardened sufficiently to allow of a perfectly satisfactory microscopical examination, but it was possible to make out the absence of granular degeneration or atrophy of the ganglion cells of the grey cornua and of the nerve-fibres so well seen in Case 1.

*REMARKS.*—The above-described cases exemplify the most constant and characteristic symptoms of progressive muscular atrophy. Cases 4, 1, and 2, were photographed shortly after admission, and their photographs show the disease in three stages. In Case 4 the hands alone are affected, in Case 1 the disease has gone some distance up the arms, and in Case 2 the patient stands with his head hanging down and his arms, as if lifeless, kept out from the side by iron supports. They all resemble each other in the preliminary nervous symptoms, in the gradual onset and course, in the upper extremities being principally affected, in the absence of any hereditary history or of any

specific taint, in the at least temporary improvement from the use of the continuous current and shampooing, and in the capricious manner in which the disease advanced. In one case the disease simultaneously attacks both hands, in another it attacks one hand, and a short time after jumps across to the other; in another it goes from one hand round by the shoulders down the opposite limb, and in a fourth it commences in the shoulder. The urine was only abnormal in one, and a microscopical examination of the kidneys only showed a doubtful commencing cirrhosis.

The subject of muscular atrophy has been investigated by men now celebrated in the profession; many hundreds of recorded cases have been analysed by them, and thus various laws of the disease have been evolved. We will not attempt to follow in their track, but we will simply state our conclusions regarding the pathology of the disease—conclusions based on our own cases alone, and supported or not contradicted by the examination of other recorded cases.

In the first place, has the disease a muscular or a nervous origin? The balance appears to us to be on the side of the latter opinion, and for the following reasons.

1st. The onset of the disease was in all these cases characterised by symptoms referable to the nervous system—viz., a feeling of "pins and needles," neuralgic pains, numbness, and susceptibility to slight changes of temperature in the affected part.

2nd. On the muscular theory, how can we explain its peculiar course—viz., its invading one hand, passing up the arm for some distance, and then affecting the opposite hand? Why does it attack one bunch of muscles and pass by another bunch in close contiguity? If it is said to affect them like cancer, &c., it ought to proceed according to similar laws; but it does not. On the theory that it is a disease of the cord, its course, we submit, is just what we ought to expect. If we suppose a diseased action to have commenced at a certain point in the cord, from that point it will spread upwards, downwards, and laterally. In the present state of our knowledge there is no reason why it should not spread in one case more laterally, or more upwards, or more downwards than it may in one of these directions or another, hence the variations in the location of the paralysis in such cases.

3rd. The treatment that was most successful in restoring bulk and form to the wasted muscles was such as we are led to believe would accelerate their destruction were they the seat of active disease, and is similar to the probable cause of the disease—viz., overwork of the affected part. The treatment is also similar to that most effectual in paralysis of muscles of undoubted central origin.

4th. The disease in the cord was much in advance of the peripheral lesion. Regions of the cord were gravely diseased, whilst the muscles that take their nervous origin from that region showed no sign of either functional or organic change. Were the disease muscular, and did it react on the cord, we would naturally expect to find the muscular lesion more extensive than the spinal.

5th.—The fact that spinal cords, taken from patients who had died from this disease, have, even after a rough microscopical examination, been pronounced healthy, is no objection to the theory of

the nervous origin, because the cord of Case 1 to touch and sight showed no disease, whilst all the cords that have been examined lately by competent and careful microscopists show extensive and pretty uniform changes.

We publish the last case because we think it may throw some light, although perhaps a false light, on the other cases. For a part of its course it was indistinguishable from one of progressive muscular atrophy, during which time there is now no doubt but that the moderate pressure of the abscess on the cord was the cause of the symptoms. With dilated bloodvessels coated outside by a tolerably thick layer of apparently effused material, and with a dilated central canal filled with proliferating cells, and not with mere debris, may not a gradually increasing and extending pressure bring about and extend the disease named progressive muscular atrophy, and may not the effusion be the result of a chronic inflammatory action?

Liverpool.

## ON EXCISION OF THE ANKLE.\*

By JAMES F. WEST, F.R.C.S.,

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Excision of the ankle, although admitted to be of the highest value in gunshot fractures of the bones implicating the tibio-tarsal articulation, and also to be very suitable in severe cases of compound dislocation of the ankle, has not hitherto been regarded with much favor for chronic disease of that joint.

Resection has probably been less frequently performed of this than of any of the other joints. Objections have been made to it on various grounds. Prejudice against the operation has been entertained and freely expressed by some, who, having never performed it, have condemned it as useless, or even improper, for chronic affections of the ankle-joint. Thus Holmes, in the first edition of his *System of Surgery*, spoke disparagingly of the operation, having never done it; but in his second edition he says—"my individual experience, though limited to two cases, which recovered very rapidly, has been very satisfactory. .... I believe it is very advisable and advantageous in appropriate cases." And again he says in another place—"In cases of successful excision the limb is very much superior in usefulness to any stump which can be formed, whether by Syme's or any other method of amputation." Others who have had one or two unfortunate cases have been deterred from performing resection again, forgetting that almost always the early days of any operation are beset with obstacles and disappointments. On the other hand, those who, like Hancock, Langenbeck, Lee, and Heyfelder, have given it a fair trial have been rewarded with excellent results; and their success ought, I think, to establish it for ever as one of the most legitimate resections of joints which surgery has at its command.

Resection of the ankle, or, in fact, of any other joint, is of course not justifiable until attempts

have been made to remedy the joint-mischief by all the means at our disposal. Rest; immobilisation; counter-irritation, by blisters, iodine, or by the actual cautery; and, lastly, free incision into the joint and removal, if possible, of any fragments of loose necrosed bone,—must each, in succession, have been resorted to; while at the same time the patient's general condition has been to the utmost improved by fresh air, good living, and such tonics as iron, quinine, and cod-liver oil.

Still, after the adoption of all these measures, suppuration in and about the joint, pulpy degeneration of synovial membrane, ulceration of cartilage, and caries of the cancellous structure of the bones, will in some cases continue, and then arises the question, Shall the leg be amputated by Syme's or Pirogoff's method, or shall the patient have the chance first offered to him of keeping his foot, even although this will necessitate a somewhat difficult and tedious operation and a protracted convalescence?

I entertain a strong opinion that by adopting Ollier's (of Lyons) mode of subperiosteal resection, the future history of excision of the ankle will be far more satisfactory than the past has been. Experience has also shown that partial resections had better be given up, and that it is better to exercise the entire joint than to limit the operation to the removal of the obviously diseased portions of it. Attention to the following measures during the after-treatment will also add greatly to the number of successful cases:—1. Early and complete immobilisation of the limb. 2. The use of the anterior iron bracketed splint, by means of which, as after resections of the knee, the leg can be suspended in a Salter's swing, and the lateral openings formed in the joint dressed without much disturbance of the parts. Lastly, the employment of drainage-tubes, passed from one side of the ankle to the other, by which pus and carious debris may be removed, and through which the wound may be daily washed out by some weak disinfecting solution, as carbolic acid or Condy's fluid.

The originator of resections, as of so many things that still hold good in surgery, was Celsus, as we learn from this passage: "*Ideo quod excedit, abscindendum est.*" But the first to apply this principle to the ankle was an English provincial surgeon, Hey, of Leeds, who in 1766 resected the lower ends of the tibia and fibula for compound dislocation; and since that time resection of the ankle has frequently been performed under similar circumstances with such good results that few would question the propriety of performing resection for compound dislocation of that joint, rather than of at once recommending amputation of the leg. Hey's success led to the adoption of the operation for chronic articular disease by Moreau, and in 1792 he first removed the lower ends of tibia and fibula for disease.

It is perhaps advisable to recall the names of those who have performed the operation, and who have expressed their opinion in favor of it, before calling attention to the case which I intend to bring under notice, and which I hope and believe will induce many other surgeons to give it a trial in any suitable case they may have under their care.

Mr. Hancock, in his lectures at the Royal College of Surgeons in 1867, referred to 19 successful cases of his own, and mentioned that Heyfelder had given 26 examples of this operation, of which

\* A paper read before the Birmingham and Midland Counties Branch of the British Medical Association.

5 died, 1 suffered consecutive amputation, and the rest proved successful; and that of Jaeger's 24 cases 23 proved successful and only 1 died.\*

Mr. Stokes, in the *Dublin Quarterly Review* of 1870 enumerates 51 cases of resection of this joint, with good results in 38. No doubt many of these operations were performed for traumatic injuries, and objection may be taken to them on that account; but, on the other hand, numerous cases may be found in the medical journals of the past few years, and in the works of recent surgical writers, in which resection has been performed for chronic articular disease with admirable results. Thus, in March, 1870, Mr. Erichsen excised the ankle of a woman, aged twenty-eight, for scrofulous disease of the ankle, removing at the same time part of the os calcis, with success.

In December, 1870, Dr. Watson showed at the Medico-Chirurgical Society of Edinburgh a boy from whose right foot he had some months previously excised the astragalus and the ends of the tibia and fibula. The result was remarkably good, the patient being able to stand on the foot, having considerable power of flexion and extension, and the limb not being shortened more than half an inch.

In the *British Medical Journal* of Sept. 7th, 1872, Mr. Sydney Jones records the case of a boy aged fifteen, whose ankle was excised for articular caries on Jan. 24th. The limb was not taken off the splint for two months, and "there was then firm bony union, and the line of the foot with the leg was very good."

Chassaignac† performed resection of the ankle on a woman aged twenty-three for chronic suppuration in the joint and necrosis of the fibula, in whom there was such "extreme mobility of the foot that it was only held in place by the skin and by the tendons, which were in part exposed," and yet after two months a good recovery occurred.

Ollier, of Lyons, relates a case of resection for comminuted fracture of the bones of the ankle, which seems to surpass all the others on record, for in that instance there was so much reproduction of bone that the patient could walk ten miles, and even dance.

Sédillot, in a memoir read before the Academy of Sciences in 1867, also speaks highly of his experience of this operation.

Lastly, in Jan. 1874, and again in May, 1875, Mr. Henry Lee brought the subject of resection of the ankle forward at the Medico-Chirurgical Society of London, and after relating his own experience, which was highly in favor of it, a discussion ensued, in which Messrs. MacCormac, Maunder, and other joined, and most of them had a good report to give of the operation.

I will now briefly narrate a case in my practice, and then call attention to the mode of operating which I prefer, and to the advantages which resection offers.

Alfred C—, aged sixteen, a stable-boy, was admitted into the Queen's Hospital on Nov. 10th, 1873, for synovitis of the ankle-joint, followed by osteitis of the tibia and fibula. The following history was obtained:—Ten weeks previously he had sprained his ankle while jumping from a loft, a distance of ten feet. Considerable swelling followed, but not much pain, so that he was able to

continue his work for a fortnight; at the end of that time he was obliged to take to his bed. Previous to admission an incision had been made into the swelling, and a large quantity of pus evacuated. He complained of great pain in the joint at night.

On admission, there was considerable swelling around the ankle, and the patient was unable to put the foot to the ground. Openings on either side of the joint discharged a large quantity of fetid pus. There was great pain on the slightest movement, and the patient could obtain but little rest at night. By means of a probe it was found that the lower ends of the fibula and tibia were necrosed to a considerable extent. The joint was immobilised by means of a gutta-percha splint, and the patient was ordered half an ounce of the iodide-of-iron mixture three times a day.

Nov. 25th.—Patient's health being remarkably good, but the purulent discharge continuing copious, chloroform was administered, the actual cautery applied to the surface, and subsequently a drainage-tube passed right through the joint.

Dec. 20th.—The lad's general health being good, and the case seeming favorable for resection, the operation was performed as follows:—Lateral incisions were made parallel to the tibia and fibula; the fibula was first divided with the chain saw, then the tibia with Butcher's saw, and lastly the astragalus with Hey's saw. The articular surfaces of all the bones were found to be devoid of cartilage and superficially necrosed. The operation was performed by Ollier's subperiosteal method, and, Esmarch's bandage having been used, it was quite bloodless. No tendons were divided. A drainage-tube was inserted between the bones of the leg and foot, and the limb at once immobilised with bandages and a gutta-percha splint. Chloroform was used, and well borne by the patient.

28th.—A week after the operation it was noticed that there was free discharge, and that the patient's condition was very good. An anterior splint and swing apparatus (Salter's) were employed. A fresh drainage-tube was passed through from one side of the joint to the other, and he was ordered one ounce of quinine mixture three times a day.

Jan. 22nd.—Less discharge; limb comfortable; eats and sleeps well. Carbolic acid lotion used for dressing, as the discharge is fetid.

Feb. 2nd.—Granulations in the wound rather exuberant. Red lotion to be used, and pressure made by means of a piece of sheet lead around the ankle.

March 2nd.—Wound nearly healed, and much general consolidation about the union of the bones, so that he can lift the limb easily. This was about eleven weeks after operation.

A starch bandage was subsequently applied, and it was noticed on March 28rd that the union of the bones was firmly consolidated, that the lines of incisions looked healthy, but that there was still some discharge of pus.

April 4th.—Patient left the hospital, less than four months after the operation, with the wounds discharging but little, and the shortening was then about one inch.

He is now, December, 1875, able to earn his living, and to walk four to five miles without inconvenience.\*

\* THE LANCET, 1867.

† Operations Chirurgicales, vol. i., p. 706.

\* The patient was exhibited at the meeting on Dec. 9th, 1875; there was not more than an inch of shortening, and the bones of

My manner of making the incisions in this case was almost identical with that described and recommended by Hancock, except that the lateral incisions were not carried forwards and downwards on the tibial side as far as the projection of the inner cuneiform bone, nor on the fibular side to within half an inch of the base of the outer metatarsal bone; such free incisions are, in my opinion, rarely necessary, and further tend rather to lead to subsequent suppuration among the tarsal bones. Lateral incisions are far preferable to the semi-circular incisions which I have seen employed at the Leeds Infirmary and elsewhere, inasmuch as with the former all the tendons are saved, and no vessel of importance is divided. Excision of the ankle is one of those operations in which the advantages afforded by Esmarch's bandage are most appreciated. Not only is the patient free from hemorrhage, but in consequence of the parts not being covered with blood, we can see clearly what we are doing, and need only take away as much of either of the bones as is absolutely diseased, and if on taking one section of bone caries is still evident, we can take a slice after a slice of bone away until we get to sound osseous tissue, without having our view of the joint cavity in any way obstructed. The joint having been opened on the outer side and the fibula exposed, I separate the periosteum from it with the raspator, and then cut off the lower end of that bone with the chain-saw. I prefer the chain-saw because it can readily be passed round the bone, and can be kept close to it, so as not to endanger the peronei tendons, and hence I think it presents greater advantages than Hey's or Butcher's saw. I then divide the internal lateral ligament, keeping close to the bone, so as to avoid the flexor tendons and the posterior tibial artery, push the lower end of the tibia through the fibular opening, denude the periosteum, and cut the articular surface and inner malleolus off with Butcher's saw, and lastly with Hey's saw I remove the upper part of the astragalus. Should that bone be extensively diseased it should be freely gouged, and the carious or necrosed portions cleared out with the osteotrite. In some cases it has been successfully removed entire, along with some portion of other of the tarsal bones, as in Mr. Swain's case of a boy, aged fourteen, for whom at various times he excised the ankle-joint and the bones of the tarsus for caries; but, as a rule, when more than one of the tarsal bones is largely affected with caries, it will be better to amputate at once by Syme's method. Pirogoff's operation, though recommended by some surgeons, is not, as I have before proved, suitable in such cases, in consequence of the great risk of caries recurring in the remaining portion of the os calcis.

I hold that complete resection of the joint is better than partial, and in that respect I differ from Mr. Bryant, who says, "Resection in cases of disease is very hazardous, except in partial resection of the fibula, which is generally successful." Now, having myself tried partial resection of the fibula more than once, and especially recently on a boy aged sixteen, whose disease seemed limited to that bone, and having had subsequently to submit the patient to secondary amputation, I cannot agree with Mr. Bryant's opinion, and I

think he will modify it when he has had some personal experience of complete resection of the ankle, which up to the present time he admits he has not had.

Immobilisation of the limb before the patient leaves the operating-table I deem to be essential. I care very little whether that condition be obtained by a gutta-percha or leather case or by a starch or plaster of Paris bandage with suitable windows on either side of the ankle, but the immobilisation must be thorough, and the apparatus, whatever it is, should not, if it can be avoided, be disturbed for at least a couple of months. The limb may, with comfort to the patient, be suspended by one of Bartleet's or Watson's anterior splints in a Salter's swing.

As new bone is often formed rapidly in young subjects, and concomitantly there is an abundance of exudation material about the ankle, it is advisable in the course of two or three months to give support and compression to the new tissues by means of a piece of sheet lead one-eighth of an inch in thickness, retained *in situ* by careful bandaging.

Another feature of the operation of great value, to my thinking, is the preservation of the periosteum by means of careful employment of the raspator, so as to avoid slitting that membrane. The instrument should be kept as close to the bone as possible, so as to detach some of the bone granules along with the periosteum.

The idea of regenerating bone by this means, so generally attributed to Ollier, of Lyons, belongs, as Giraldès candidly points out in his "Mal. Chir. des Enfants," to our countryman Goodsir, who, as early as 1845, discovered the fact that by preservation of the periosteum with the subjacent and still adherent fine particles of bone new bone could be formed.

Preservation of the length of the limb and greater consolidation of the parts, both points of immense importance as regards the patient's future condition, are gained by this method of subperiosteal resection, and I cordially echo all that has been said in its favor by Professor von Langenbeck in his work "On the After-results of Joint Resections," and not less by another great authority in the treatment of diseases of joints, Dr. Sayre, of New York. Drainage-tubes applied at the time of resection, so that the joint cavity may be kept free from discharge, and thoroughly cleansed daily with some weak disinfectant solution, are small, though not unimportant, matters to be attended to in the after-treatment of the case.

Having now glanced at most of the points connected with the operation, let me, in conclusion, commend it to your consideration. It may be the means of saving a foot; it is true the foot will probably be ankylosed to the bones of the leg, but still it will prove more valuable and convenient for walking than any artificial foot that can be fitted to a stump. Sometimes there is a sort of fibrous ankylosis between the bones of the leg and foot which allows of such free movement that the patient, as in one of Ollier's cases, may walk ten miles and dance an evening through. Firm bony ankylosis is very likely to result, and there will probably be comparatively little shortening if the periosteum is left.

The chief objection that can be urged against the operation is that recovery from it is tedious and protracted, and therefore that it is more ap-

the leg and foot were firmly ankylosed together. Mr. Prosser, of Bromsgrove, has paid great attention to the boy, and has conducted largely to the good result.



plicable for patients in the upper class of society than to those who are found in hospitals. Still this is after all not a very formidable objection; three to six months' confinement will certainly be necessary, but perhaps a patient who had submitted to amputation of the leg might be quite as long before his stump would bear the pressure of an artificial limb.

Another argument in favor of resection is that it is scarcely a more dangerous operation than amputation, either at the ankle or in the lower third of the leg; and, lastly, it has this to its credit, that should resection fail, as it sometimes does, from such patients having but little constitutional or recuperative power, we can still submit the limb to amputation as a *dernier ressort*.

Birmingham.

## ON SALICYLIC ACID.

By J. C. OGILVIE WILL, M.D.,

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ALTHOUGH salicylic acid has been much vaunted by continental surgeons, more especially by Thiersch and Kolbe, as superior as an antiseptic to carbolic acid, it has not, so far as I am aware, come into general use in this country, and the recent discussion at the Clinical Society will probably not do much to advance its cause. A pretty extended trial of it has, however, convinced me that in it we possess an agent of extreme value in a large class of cases; but I do not intend at present entering on a detailed account of the cases in which it is found useful, but simply to direct attention to its value as an antiseptic, to its advantages over other substances used for a like purpose, and to a few of the forms in which it may be employed, with brief notes of some cases as illustrative of its beneficial action.

Godeffroy, by a series of careful experiments, proved that salicylic acid is three times as powerful in its anti-fermentative action as carbolic acid. He used dough formed of yeast, flour, and water, to separate portions of which he added varying quantities of carbolic and salicylic acids, and noted the length of time that elapsed before fermentation took place. In other experiments, milk, urine, beer, mustard-meal, and other substances have been employed, the results invariably proving that fermentation was either prevented or greatly retarded by the addition of salicylic acid. For example, fresh cow's milk mixed with 0.04 per cent. of salicylic acid, curdled thirty-six hours later than a similar quantity of milk to which no agent had been added; urine, to which salicylic acid had been added, remained clear and free from odor till the third day, while another specimen of the same urine, with which nothing had been mixed, was putrid. Its anti-fermentative powers are already so well recognised by chemists in this country, that many of them add small quantities of the acid to such preparations as are liable to undergo fermentative decomposition, with most satisfactory results. These experiments are undoubtedly conclusive as to the value of the agent used as a preventive of fermentation, and experience has proved that it is equally reliable as a preventive and cor-

rective of putrefaction when applied to sores and wounds, and that it materially assists reparative action.

In proof of its powers as a corrector of putrefaction, I may briefly refer to two cases: one of amputation of the thigh, at present under Prof. Pirrie's care in the Aberdeen Royal Infirmary; the other, mammary cancer.

The former patient, a girl aged nineteen, was the subject of extensive necrosis of the femur; she was much reduced, and amputation was had recourse to, but with very grave doubts as to the ultimate result. The vessels were acupressed and water-dressing applied. As was expected, there was considerable suppuration, accompanied by great fetor. The applications used at this time were daily syringing with 1 to 40 solution of carbolic acid and dressings impregnated with red lotion. Salicylic ointment was then applied, and within two days the fetor entirely disappeared and healing action commenced. I on several occasions directed the attention of the students to the almost marvellous change that in this case followed the use of the new antiseptic. Another noteworthy point connected with the case was the extremely small, healthy, and highly vascular condition of the granulations with which the lips of the wound were studded, forming a marked contrast to those which Mr. Callender stated he had seen when salicylic dressings were employed. The ointment used was the one containing paraffin, the formula for which will be found below, and though it is a pretty strong one—1 part of acid to 7,—the patient repeatedly stated that it neither gave rise to pain nor smarting.

In a case of medullary cancer of the mamma, where the fungoid growth involved the entire gland, extended upwards nearly to the clavicle and well down into the axilla, and from which the fetor was so intense that the patient had to be removed to an out-of-the-way apartment, I ordered daily syringing with a 1 to 40 carbolic solution and a liniment of olive oil and salicylic acid, with which the sore was covered. By these applications putrefactive changes were arrested, the fetor disappeared, and the patient was rendered comparatively comfortable, while the attendants were not, as before, repelled from attending to her, which they had been by the disgusting odor pervading the atmosphere surrounding her.

These two cases of themselves show that salicylic acid is a trustworthy antiseptic. But carbolic acid has been proved beyond doubt to be so also, and boracic acid is largely used for similar purposes; therefore, unless salicylic acid possesses advantages over both, its substitution for either cannot be justified. It does, however, seem to me to possess certain advantages, which, though few in number, are not of less importance on that account; they may, I think, be best elicited by comparing carbolic and boracic acids with it. The two manifest objections to the use of carbolic acid, valuable agent though it be, are its irritating action and its smell. Salicylic acid can hardly be termed an irritant, and preparations containing only a small percentage of it can be thoroughly relied on as trustworthy antiputrescents, and it is odorless. These two points constitute its main claims to superiority to carbolic acid. The more important of the two is, however, not yet universally allowed, for, from the statements made by Mr. Callender and Sir William Jenner at the Clinical Society's re-



cent meeting, it would seem that in their experience salicylic acid had displayed most markedly irritant properties. But this is utterly at variance with the observations of continental observers, and also with my own, even where very much stronger preparations have been employed, for, though I have used it constantly since January, in only one case has pain been complained of—in that of a large varicose ulcer of the leg, for which a 1 to 8 ointment was prescribed,—and I have never seen the vesicular eruption, to which Sir William Jenner referred, following its action. But bearing the remarks of these accurate observers in mind, and for the purpose of testing whether it really gives rise to irritation or not, I dusted a granulating surface with the pure acid, purposely selecting a very nervous and susceptible patient, and one who was prone to give vent to his feelings on the slightest provocation. A number of students were present in the ward at the time, and heard the man state distinctly that he felt neither pain nor smarting; an hour afterwards I again visited him, and he still said that there had not been any pain. I then applied a little water to the acid, and rubbed it gently into the surface, but, beyond the slight uneasiness due to the pressure of my finger, he felt nothing, and next day the nurse said that she thought the man had been easier than usual. It seems almost impossible to reconcile this statement with those before referred to as emanating from Mr. Callender and Sir W. Jenner, and so different are they that one would be almost led to infer that either my sample of acid was a very weak one, and theirs a very strong one, or that some impurity had crept into the specimen employed, or that it was due to some peculiarity of constitution of the patients treated by it.

With regard to boracic acid, very many still doubt its reliability as an antiseptic, and I confess I am not yet convinced that implicit trust can be placed in it; but even granting that it is a useful agent, on account of the extreme difficulty of blending it with fatty substances it is the bane of those who have to compound ointments into the composition of which it enters. Salicylic acid can, on the contrary, be easily incorporated with such menstrea; salicylic acid is, on the other hand, only sparingly soluble in water, but a sufficiently strong watery solution can be readily prepared by the addition of a small quantity of bichloride of soda and heating. The presence of a minute portion of borax could only seldom be looked on as objectionable, and might in fact be of value in those cases where the action of a mild astringent is indicated. Still, as aqueous solutions of carbolic and boracic acids of the strength now in vogue do not act as irritants, it is unlikely that watery solutions of salicylic acid will ever come into general use, though Thiersch and others employ them. I certainly do not class this as a virtue possessed by the new antiseptic, but for the reasons given it can hardly be looked on as an objection. Finally, salicylic acid is not volatile, therefore dressings impregnated with it retain their antiseptic properties longer; it is tasteless, and non-poisonous.

*Preparations of Salicylic Acid.*—Thiersch, who follows Lister's mode of treatment, with the exception of the substitution of salicylic for carbolic acid, employs cotton-wadding or jute impregnated with the acid in place of gauze; but as the preparation of his dressings is a complicated process, and requires a lengthy description, I may

refer to notices of his paper which appeared in a medical contemporary for May 26th and June 2nd of the present year, where full particulars are given. The watery solutions employed by him contain 1 part of acid in 300 parts of water. As an application to granulating surfaces a lotion containing 1 part of acid, 8 of sodium phosphate, and 50 of water has been found useful. As already mentioned, heat and the addition of borax increase its solubility; a clear lotion of considerable strength can thus be obtained: for instance, ten grains of acid can be readily dissolved in one ounce of water by heating and then adding six grains of borax, or even twenty grains of the acid will be taken up by an ounce of water if fourteen grains of borax are added. These solutions, in addition to their use as lotions, may be used as gargles, where an antiseptic and astringent gargle is indicated. To a surface where it can be accurately applied, and where the discharge is slight, though I have tried it with excellent effect where it was profuse, as in the case of the girl above noticed, the cerate suggested by Professor Lister for rodent ulcer—salicylic taking the place of boracic acid—is a nice application. The formula is from half a drachm to a drachm of salicylic acid, one drachm of white wax, two drachms of paraffin, and two drachms of almond oil; melt and rub up in a heated mortar. It should be spread on strips of muslin or fine linen.

Another ointment may be made of sperm oil, one drachm and a half; oil of theobroma, five drachms and a half; salicylic acid, from half a drachm to a drachm. This forms a thick paste, which should be thickly spread on lint. The heat of the surface acting on the oil of theobroma, a diffusible ointment is formed, which is a suitable application when it is desired to have the discharge thoroughly saturated with the antiseptic. An ointment less easily acted on by the body-heat consists of sperm oil and paraffin, of each a drachm and a half; oil of theobroma, two drachms; oil of almonds, one drachm; salicylic acid, from half a drachm to a drachm.

A very simple and most useful ointment, and one which answers admirably in some affections of the skin, is formed of half a drachm to a drachm of the acid to seven drachms of simple ointment. Though neither watery nor oily preparations of this acid belong to what is termed elegant pharmacy, yet a liniment of salicylic acid and olive oil will be found of much efficacy in burns; as an example, I may cite a case of burn, involving the upper arm and nearly the whole back of a child aged seven, where I recently employed it. Carron oil had been applied; and when my advice was requested, two days after, free suppuration had taken place, accompanied by great fetor. Lint soaked in olive oil and salicylic acid—twelve drachms of the acid to sixteen ounces of oil—was prescribed. The result was most satisfactory; the fetor disappearing, the suppuration rapidly decreasing, the pain greatly abating, and kindly healing action taking place. In less than a fortnight the whole surface was healed, with the exception of two small spots covered by healthy granulations, to which red lotion was applied. I have since found that a much weaker oily solution (two drachms of the acid to eight ounces of oil) was all-sufficient in a case of severe scald of the foot lately under treatment.

For cancerous sores Thiersch recommends dust-

ing with the pure acid, or with equal parts of the powder and starch, or powder formed of charcoal and the acid might be employed for the same purpose, or for dusting over the face of poultices applied to sloughing surfaces. Endless preparations might be devised; but those I have described seem to me as useful as any combinations with which I am acquainted, and therefore I shall leave others to modify them in any way that may suit their tastes or modes of treatment.

Though I stated in the outset that I did not intend entering on details of cases, yet I cannot refrain from urging its use in eczematous affections, for nowhere is its beneficial action more marked than in them. In the eczema of children, more especially in that found affecting the head and face, it is far superior to any remedy I have yet employed; it was, in fact, the results attending the use of salicylic acid in a case of the kind that first convinced me of its value, and I have since found that others have formed a like estimate of it in similar cases. A child, aged eighteen months, had been under my care for many weeks with a patch of eczema rubrum on the cheek; I had tried all kinds of local applications, and had given arsenic and iron wine internally, but with no avail; for though at times it seemed to be giving way to treatment, a fit of itching, I suppose, had caused the child to rub it, and increased irritation always followed. I had not before used salicylic acid, and had but little faith in good accruing from its exhibition, but as a last resource I prescribed an ointment containing one drachm of acid to an ounce of lard. When I next visited the child, a few days after, the patch had nearly healed, and very shortly after it was perfectly whole. In another case the result was almost equally striking, but here it was the first application used. A child, aged six months, had a patch of E. impetiginodes on the occiput; it had first appeared about a month before. As some parts were thickly covered by crusts, a poultice was used to detach them, and then salicylic ointment was rubbed in. In six days every vestige of disease had disappeared. A brother and sister, aged three and five, were the subjects of eczema narium of short standing. Salicylic ointment was applied on a Friday, and on the following Monday the surfaces were perfectly healed. It is unnecessary to occupy space by entering on details of other cases, but I may simply say that in very many I have found it answer admirably.

Aberdeen.

## ON GELSEMINUM SEMPERVIRENS.

By SYDNEY RINGER, M.D.,

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and

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This powerful drug has long been employed in America, and a few years ago was introduced into this country as a remedy for neuralgia by Dr. Wickham Legg. His statements have been amply

verified by Dr. Sawyer, Dr. Mackey, Dr. Spencer Thompson, and others. It is said to be especially useful in non-inflammatory toothache and in neuralgia in the nerves supplying the teeth and the alveolar processes of the jaw. In large doses it produces general paralysis. Several cases of poisoning are recorded, some ending fatally.

We extract from the Proceedings of the American Pharmaceutical Association (vol. xxi., 1878) the following account of the effects resulting from a toxic dose:—"The symptoms by which its effects manifest themselves in the animal economy seem to indicate that its energy is primarily exerted on the cerebro-spinal centres, and secondarily on the respiratory apparatus and the heart, the functions of the former ceasing before those of the latter. The motor nerves of the eye are attacked first; objects cannot be fixed, dodging their position; the eyelids become paralysed, drop down, and cannot be raised voluntarily; the pupils largely dilate; there is a feeling of lightness in the tongue; it ascends gradually to the roof of the mouth; pronunciation becomes slurred; then the extremities refuse to support the body, and erect motion without support becomes impossible; the pulse gradually becomes more frequent, rises to 120 to 180 and more beats per minute, is small but regular; respiration then becomes labored, the mind remaining clear, however. This state will set in about an hour and a half after the ingestion of an overdose of the drug. .... All the symptoms will disappear after about two hours, leaving no unpleasant effect or derangement of the organism." In many cases of poisoning the patients have complained of double vision, and dimness, even loss, of sight, and the breathing is slow and sometimes irregular and shallow.

In the *Practitioner* for October, 1870, Dr. Roberts Bartholow published an account of some experiments made on frogs, pigeons, and cats. He concludes that gelseminum (a) acts chiefly on the motor portion of the cord; (b) its paralyzing effect is due to its action on the motor centre, and not to an action on the peripheral nerve-fibres; (c) it acts also on the sensory portion of the cord, producing at last complete anæsthesia, but this effect in warm-blooded animals and in man is toxic only, and follows the paralysis of the motor functions.

As this drug is now attracting considerable attention in this country, and has been largely used in America for fevers, including ague and influenza, hemicrania, spermatorrhœa, dysmenorrhœa, &c., we were induced to make these investigations, which will be seen in many respects to corroborate the conclusions of Dr. Roberts Bartholow. At first we used the liquid extract prepared in America, which contains some spirit, but afterwards the alkaloid dissolved in water, extracted by Mr. Gerrard, teacher of Pharmacy at University College.

We now proceed to give a short general account of the effects produced by the drug on a frog.

A medium-sized German frog was injected with the drug in the neighborhood of the posterior lymph hearts. In this, as in all our experiments in which injections were given, special precautions were taken to ensure cleanliness of the apparatus, and freedom from contamination by other drugs. Soon after the administration of the drug the animal became extremely apathetic, and it was found that there was considerable impairment both of voluntary power and reflex action. When placed

on its back the frog made no attempt to resume its normal position for a minute or two, and then slowly turned over, often, however, stopping half-way and lying motionless on its side. On touching the eyes they were closed, but some minutes elapsed before they were again opened, and even then the movement was performed with abnormal slowness. The loss of voluntary power and reflex action gradually increased, and the animal soon became perfectly motionless. When placed on its back no attempt was made to turn over. The whole body was limp and flaccid, and the limbs remained in any position in which they were placed, either flexed or extended. On pinching firmly any part of the body, a very feeble and ineffectual attempt to escape was made, the animal, in its unavailing efforts, falling over on its back or sides. The application of the poles of the battery to the limbs excited, in addition to the muscular contraction, faint reflex movements. *Pari passu* with these changes in the nervous system, the breathing became hurried and superficial, and as the paralysis increased, the respiratory movements became more and more shallow, and, finally, with the total abolition of voluntary power and reflex action, entirely ceased. The heart continued beating for a considerable time after the cessation of the respiratory movements.

The rapidity with which these symptoms presented themselves, and the ultimate termination of the cases, varied with the dose administered. Thus twelve minims of the liquid extract injected under the skin of a large frog produced such an impairment of voluntary power that in three minutes the animal was unable to turn over, and in two and a half hours death ensued. In doses of five minims or less, some hours usually elapsed before the establishment of complete paralysis, and the animals frequently remained alive, but perfectly helpless for many days. In one instance, in which a five-minim dose had been given, life was prolonged until the tenth day. Towards the close of this period there was considerable improvement both in voluntary power and reflex action; the effects of the drug appeared to be passing off, and hopes were at one time entertained of the ultimate recovery of the animal. A five-minim dose of the 1 in 20 solution of the alkaloid gave rise to decided symptoms of poisoning in four minutes, and in five minutes later the full effects of the drug were exhibited.

With some frogs there occurred for a short time a peculiar mixed state. Thus, soon after voluntary and reflex power was completely abolished, on irritating one of the limbs, the hind extremities were sometimes shot out, and all their muscles, with those of the back, contracted. This happened only occasionally. Thus, generally, on applying the electrodes to an extremity, only the muscle touched contracted, and none others; but sometimes there ensued the tetanoid condition just described; in a few minutes this ceased. With other frogs there occurred only a slight tremor of some of the muscles of the legs, chiefly those of the thigh. This tremor was at once excited by moving or jerking the body. It was apparently caused by the successive contraction of the muscles of the limb, giving rise to a peculiar flickering, which was readily perceived through the skin. Supposing these phenomena to be due to the influence of the drug, they must be caused by its action on the spinal cord, for they occurred in the posterior extremities after ligation of the abdominal aorta.

Another circumstance also attracted our attention. When the electrodes are applied over the lower part of the spine of a live healthy frog, the hind legs are shot out much in the manner before described. Now it appeared to us that after poisoning by gelseminum the posterior extremities were more forcibly extended, and remained so for a longer time.

We then performed the following experiments to ascertain whether gelseminum paralyses by its effect on the brain, the cord, the motor or sensory nerves, or the muscles.

The paralysis of reflex and voluntary power is certainly not due to the action of the drug on the muscles; for after poisoning, on galvanic stimulation the muscles contracted as energetically as those of an unpoisoned animal; moreover, on several occasions we tied the abdominal aorta or the femoral artery and vein, and twice we severed the thigh, leaving the leg attached to the trunk only by the nerve, and then poisoned the animal, and we found that the muscles subjected to the action of the gelseminum contracted as energetically and retained their contractility as long as the muscles protected from the poison by ligation or section of the vessels.

Neither is the paralysis due to the action of gelseminum on the motor nerves. This, indeed, is proved by the experiments just mentioned, which we now proceed to describe more fully. We tied the femoral vessels on several occasions, and twice we cut through all the structures of the thigh, except the nerve, which alone connected the severed leg with the trunk, and then poisoned the animal by injecting the drug under the skin of the back, in the neighborhood of the lymph sacs. The paralysis occurred as soon, progressed as rapidly, and became as complete in the limb protected by ligation or section from the action of the poisoned blood as in other parts subjected to the influence of the poison. After complete paralysis we found that the nerves unprotected from the action of the poison conducted as freely as those protected by ligation or section. These experiments show that the poison does not act by its effects on the ends of the motor nerves; but the trunks of the nerves in the abdomen, and above the ligation in the thigh might be affected, and the paralysis produced in this way. We therefore on three occasions ligatured the abdominal aorta, just above its bifurcation, and then poisoned the animal in the manner described, and we found the paralysis progressed in the hind protected limbs as in the anterior, and as in the case of frogs whose hind limbs are unprotected by ligation of the aorta.

There remain, then, to consider the brain, cord, and the afferent nerves. We shall treat of the loss of reflex power separately from that of voluntary power. It is obvious that the destruction of reflex power cannot be due to the effect of the poison on the brain, and as it is not due to the paralysis of the motor nerves or muscles, it must depend on paralysis either of the afferent nerves or the cord. It is not due to paralysis of the afferent nerves, for after tying the abdominal aorta before administering the poison, and thus protecting the hind extremities from its effects, we could not excite reflex action by galvanic stimulation of the hind legs. It therefore appears that gelseminum abolishes reflex action by its effect on the cord.

Does it thus affect the reflex function by its direct action on the cord, or indirectly by stimu-

lating the inhibitory centre for reflex movements? It does not act through Setschenow's inhibitory centre; for, firstly, the abolition of reflex function is too complete to be produced in this way, and, secondly, after producing complete loss of reflex action, we beheaded the frog, and so divided the cord below the inhibitory centre, which is situated in the neighborhood of the optic lobes, and yet the loss of reflex power remained as complete as before. We therefore conclude *that gelseminum destroys reflex power by its direct action on the spinal cord.*

We have next to explain how the loss of voluntary power is produced. We have shown that the paralysis is not due to the effect of the drug on the muscles and motor nerves, and it is obvious that the loss of voluntary power cannot be produced by paralysis of the sensory nerves. It must therefore be due to the action of the gelseminum either on the brain or the motor tract of the spinal cord. We have no experiments to decide this question, but we offer the following reasons in favor of the view that it acts through its influence on the cord:—(a) The loss of voluntary and reflex power proceed *pari passu*. (b) The abolition of reflex power being due to the effect on the cord renders it to some extent probable that the loss of voluntary power also depends on affection of the cord. (c) In the cases of accidental poisoning where the voluntary power was so complete that the patients could not move a muscle, could not even raise the eyelids, it is recorded that on recovery they asserted that their consciousness was not at all affected. It may be said that if the loss of voluntary power is due to paralysis of the motor tract of the spinal cord, it should not conduct electric impressions. But we may remark that a great difference of opinion exists among physiologists respecting the conducting power of the cord of electric irritation, and it appeared to us therefore unnecessary to perform this experiment.

We have seen that the afferent reflex nerves are paralysed. Are the sensory nerves affected? If the sensory nerves are also the afferent reflex nerves (the view generally held by physiologists), the question of course is answered in the negative. Still we suppose that though some afferent nerves may have this double function, yet there are others which are simply sensory. Are these paralysed, or are the sensory perceptive centres paralysed? In other words, does gelseminum destroy sensation as some writers have supposed, and if so, does it act on the sensory nerves or the sensory tracts of the cord, or on the sensory perceptive centre? These experiments do not enable us to answer these questions, but we may state that as long as voluntary movement remained, the frog seemed to feel pinching and galvanic stimulation, for on the application of either kind of irritation, the animal made voluntary efforts to escape, though after paralysis was marked it required considerable pinching to induce voluntary movement. Was this due to defective feeling or from the paralysis requiring a greater effort to cause movement? We shall return to the effect of gelseminum on sensation, when we treat of its effects on man.

The foregoing experiments prove that gelseminum abolishes reflex, and probably voluntary, movement by its influence on the spinal cord. It may, however, in addition, to a slighter extent, and late in the poisoning, affect the motor nerves. This is the case with Calabar bean, which para-

lyses the spinal cord, but also slightly the motor nerves. To learn whether gelseminum in any way depresses the motor nerves, we performed the following experiments on three frogs. We tied the iliac artery, and then poisoned the animal; and, after the loss of reflex and voluntary power, we tested at frequent intervals the conductivity of the sciatic nerves to electric stimulation, and we found that the gradual loss of the power of conduction was equal in the two nerves, but that after some time the nerve protected from the action of the poison required a rather stronger current than the unprotected nerve, due, perhaps, to diminished nutrition from arrest of the circulation. Hence we conclude that probably (for our experiments are not numerous enough to settle absolutely this question) gelseminum exerts no influence on the motor nerves.

We may here state that in each experiment in which an artery was tied we ascertained by a post-mortem examination that the operation had been successfully performed.

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#### CASE OF

### CONCUSSION OF THE SPINAL CORD;

#### WITH REMARKS.

By JOHN GAY, F.R.C.S.,

Surgeon to the Great Northern Hospital.

Notes of the Case by Mr. CARTER and Mr. CHAPMAN,  
Resident Surgeons.

JAMES S—, laborer, aged fifty-five, was admitted into the Great Northern Hospital on August 19th. On the day before, he fell from a load of barley about twelve feet on to his shoulder and neck. After being driven home, he was able to walk a few feet, and afterwards passed a motion voluntarily, but by rolling himself on to a utensil by the side of the bed. From that time his limbs became gradually weaker, and accompanied with shooting pains in the body and legs.

On admission, sensation below the shoulders and arms was found to be diminished, and voluntary motion very limited. During inspiration the diaphragm and sterno-mastoid muscles acted powerfully, the head was tilted back and chin thrown forward, whilst the intercostal muscles were passive and the spaces strongly sucked in. There was no deformity of the spine. The pupils were contracted and the tongue dry; respiration 24 to the minute, and rather irregular; pulse 60, and regular. He was placed on a water-bed, and ordered milk diet.

Aug. 20th.—Passed a restless night. His lips are rather livid. Tongue cleaner. His bowels have not acted, nor has he passed urine. On using a catheter, the urine passed in accordance with the action of the diaphragm, and seemingly without any aid from the bladder itself. He has now lost all voluntary power in his legs. Pulse 88; temperature 102°.

21st.—Has passed a better night, but suffers from a sense of weight in his chest and shoulders, which, he says, interferes with his power of speech. His bowels were open slightly in the

night. Extremities cold. Pulse 84, regular; temperature 99° 2'.

22nd.—Although more comfortable, his tongue has again become dry and furred. He has been dreaming vividly, and is slightly delirious. He sometimes sees things double; no pain in his head. Temperature has risen to 101° 8'. Sensation in the legs is still further diminished.

23rd.—Has been delirious at times, and restless during the night. Complaints of great pain in both arms. Skin very hot. Temperature 101° 8'; pulse 88, weak.

24th.—Still restless and slightly delirious; pupils contracted. Skin of trunk hot; extremities cold. Pain extended from the arms to his shoulders. Bowels acted after an enema.

26th.—Pain less in the arms, but increased at the back of the neck. Temperature 100° 4'. He has slight sensation in his legs.

28th.—Respiration 14, very deep and irregular. Tongue dry and covered with a yellowish fur. Bowels confined.

30th.—His motions are now sometimes passed involuntarily, but the bladder has recovered its power.

31st.—To-day he has incontinence of urine with priapism, and his legs are rigid.

Sept. 1st.—Urine drawn off twice a day, loaded with urates. He has still slight sensation in his legs, which he has never entirely lost, but there is no motion whatever; his legs have been given to involuntary twitching. The bladder is now syringed out with a solution of sulphurous acid (one in twenty-eight).

5th.—The urine is still thick, and has assumed an alkaline reaction. In addition to the twitching of the legs, the thighs are drawn up spasmodically, and he complains of severe pains down the back and legs. Urine and motions are still passed involuntarily.

8th.—Complaints of pain in the left side of his neck, extending to the shoulder, which is due to two cervical glands which have become swollen; one is tender on pressure. The arms are still painful.

11th.—The pain in the neck (which was very severe on the 9th) has subsided, and the glands are less swollen. He can now feel slightly the injection into the bladder, and there is tenderness on pressure over the hypogastric region.

13th.—Can retain his motions to-day a little for the first time.

20th.—There is now a perceptible recovery of power in his legs. He can hold both his water and motions better, and is altogether stronger.

By the 30th both sensation and motion had much improved, his appetite was returning, and he slept well. The general improvement continued, so that on the 25th of October he was able to sit up in a chair for an hour or two; beyond this his legs became painful. Syringing of the bladder was discontinued on the 27th, when the bowels and bladder had quite regained their functions, and the urine was clear and healthy. On the 20th of November he began to walk up and down the ward with assistance; and since that time he has been gradually recovering his health and strength. The only complaint he has is general feebleness.

*Remarks.*—We hear a great deal in law courts about "concussion of the spine," as the result of railway accident, and of "anæmia of the cord," said to be indicated by a variety of anomalous and

usually subjective symptoms only, as its frequent and often protracted result; but, for some unexplained reason, we hear very little or nothing of such contingencies after other accidents in the course of hospital practice, in cases even in which the spinal cord or some portion of it is unquestionably involved.

It was only the other day a case was partly tried in which a gentleman met with some injury in the course of a railway collision. It was said to be "concussion of the spine," followed by "spinal anæmia." Some of the earlier results of the injury, in the way of symptoms, were so anomalous as to justify a suspicion that they were, at best, simply and purely imaginary; whilst the later ones clearly impugned the notion that they were due to any direct affection of the cord, but in all probability to defective muscular power consequent on prolonged rest in a recumbent posture; and it is to exemplify a case of concussion of the spinal cord, and briefly to compare the symptoms with those which usually follow injuries which are falsely assumed to be of that nature, that the foregoing case has been narrated.

Now concussion can mean nothing if it is not interpreted as an injury in which there is an actual molecular disarrangement and separation—attrition—in the portion of cord concussed—i. e., through the sudden application of force, some molecules have moved with greater velocity than their associated molecules, either to their momentary disseverance from each other—the physical results being imperceptible to the closest scrutiny—or to their disruption, with an objective result in the form of actual solution of continuity. In either case the injury is the same in fact, but different in degree, from mere stretching of the tissues to actual laceration; and inferentially the processes of repair are conformably the same, from a little inflammatory action to inflammation with temporary effusion and, it may be, actual plastic and permanent exudation and deposit.

The relative gravity of several such cases would of course be in accord with the part of the cord injured, the extent of the injury, and, in very great measure, to the nature and extent of the processes which the act of repair would require for its completion.

If we take a spinal column and its contents, and observe the especial manner in which the precious axial cord is suspended, packed, and padded within it, and by means of its several enveloping structures, it would, I imagine, be a matter of surprise to be told that a shake of the whole body would have the effect of shaking the cord, as though it were isolated from its surroundings and free to move independently of them. It would, I think, be more credible if we were told that any such shake or concussion of the cord would be impossible without some such twisting or bending of the vertebral column—it may be short of fracture or dislocation—as would be capable of inflicting direct injury of some sort upon its contents.

This appears to me to be the only feasible way of accounting for those injuries to the cord by concussion which are followed by true cordal nerve symptoms; and the same line of reasoning would lead us to reject spinal concussion as the result of less violent injuries, especially when followed by symptoms which are equivocal or fail in expressing actual cord lesion.

Now, if I have represented the true nature of

concussion, it is obvious that, where the cord is concerned, the slightest act must be attended and followed by some sensible alteration or modification of its functions. Some marked change or enervation must inevitably take place, and to such a degree as to admit of clear appreciation.

If no such result attends a blow on the spine it might be confidently assumed that the cord and its envelopes have suffered no injury; and this inference will be strengthened if after a few days, or at the utmost a very few weeks, no symptoms arise which point simultaneously to its nature and seat.

Subsequent statements, such as "numbness" and "loss of power," with "pains in the back," and other entirely subjective symptoms, ought to be regarded with grave suspicion, as either being the hallucinations of a weak-minded and it may be, too, a feeble-bodied person, or as meant for purposes of imposture.

The case to which reference has been made was one in which, for months after the reputed injury, the signs of cordal mischief were, I submit, equivocal; and when they were said to have become pronounced, they were inconsistent with either the facts of anatomy or the laws of physiology, as we shall see hereafter. According to the patient's statement, the earlier consequences of the concussion were unconsciousness for two or three days, with either suppression or retention of urine, for several days at a time, during several weeks; and yet no catheter was used, although the gentleman was under the constant supervision of a most competent medical adviser. Up to the last, after the lapse of nine or ten months, when an examination was arranged, we were told, on seeing the patient, that he had not passed water for twenty-four, or it may be thirty-six, hours. The reason was obvious; the bladder was distended, and on mentioning the catheter, he at once passed a quantity equivalent to the normal quantity of urine for the period named. Amongst the other earlier symptoms were pain in the back and abdomen, for which he had medicine and embrocation. Glin-and-water, it appears, too, was ordered for some "cuts and scratches" on the head, accompanied with headache; and some fugitive sensations, as of "pins and needles," in his feet, were lost sight of in the course of a short time. More valid complaints of defective motion or sensation in the lower limbs were made at a later period in the clinical history of the case—about three months—although the injury was said from the first to have involved the lumbar section of the cord, indicated, as it was assumed to be, in part, by the patient's intolerance of very slight pressure on the vertebral spines in this region.

As time went on, after a few months of reclining on his couch, the lower limbs were said to have become absolutely paralytic, and to such a pitch as to be entirely devoid of either sensation or the conditions essential to voluntary motion. At the end of about ten months from the date of the accident a circular line about midway down the thigh was said to define the exact limits of sensation; whilst an act of volition did not seem to extend to any but some one of the flexors of the thigh. The range of sensation was so precisely defined that the patient alleged he could feel a pinch of the skin or pulling a hair everywhere immediately above the circular line, whilst the limb

was everywhere insensible to stimuli immediately below. Electro-magnetism, however, threw some interesting light on this part of the case, for a moderate coil induced both sensation (as manifested by expressions of pain) and, of course, abundant muscular action.

The symptoms referable to the alleged nerve-injury were in this case said to have attained their utmost severity when the examination which brought out these facts was made—i.e., they had been gradually increasing; and in order to their pathological explanation, recourse was had to a "disease" of modern discovery, I believe—namely, "anæmia of the cord" as the consequence of "concussion." I would ask, *en passant*, has such a condition been demonstrated in any case? I have looked over the Pathological Transactions for the account of such a form of disease, as well as the works of the most distinguished pathologists, but have been unable to find any clear recognition of it. In one case of Mr. Curling's of "concussion of the spine," in the 8th volume, the state of the cord was one of inflammatory degradation of tissue. According to Professor Sayre, of New York, it is a state occasionally associated with some spinal symptoms in cases of adherent prepuce in children, but I do not learn where my friend obtained the key to "anæmia" as being the source of the spinal symptoms. But to return.

Now if we contrast this case with the one—clearly of spinal concussion—above narrated, I think the features will be so striking as to afford strong evidence that they could not possibly be pathologically identical, making every allowance for diversity as to the extent and seat of injury.

The symptoms following actual concussion of the cord are, as I have remarked, due to two causes: first, to the actual injury to its texture; and, secondly, even when the first are very light and transient, to the processes of repair)—inflammation, effusion, &c.

In the general systemic disturbance, thirst, elevation of temperature, and delirium, together with grave impairment of the functions of the bladder and intestines, which followed in the case narrated, and the as gradual clearing away of all these symptoms as the cord recovered, those evidences were clearly noticeable which divide the domains of acknowledged pathology in the one case from the merely speculative and, to say the least of it, anomalous pathology in the other.

Axiomatically, whatever the gravity of the symptoms immediately following an injury, it becomes aggravated by the inroad of the processes of repair. Hence the advent of true spinal symptoms at that period subsequent to such an occurrence at which repair commences becomes indisputable evidence of its having taken place, although so slight as to have been unsupported at the time by any appreciable evidence of its existence.

One remark remains, and it is this: In cases of real spinal concussion or other injury, save fracture or dislocation, pain on pressure over the spines of the vertebrae belonging to the injured portion of cord is of very secondary if not questionable proof of lesion; whilst in spurious cases it is held up to the "gentlemen of the jury" as a most clear and indisputable symptom, especially when there is nothing better to offer.

Finsbury-place South, E.C.

# CASES OF SCIATICA AND NEURALGIA SUCCESSFULLY TREATED BY GALVANISM.

By S. J. KNOTT, M.R.C.S.,

Medical Superintendent of Galvanism, St. Mary's Hospital;  
Late Tutor and Pathologist, etc.

As sciatica and neuralgia are at times most obstinate complaints to treat, even by the most skilful, I have much pleasure in publishing several cases treated by me with galvanism, some of them most chronic, and defying all medicines. If there is any inflammation of the nerve, then galvanism must be used cautiously. I believe in all cases where the nerve is implicated that faradisation would cause great pain, and do harm. The great thing to determine is how the galvanism acts in these cases, because it does good in cases where several counter-irritants have been used, such as blisters, liniments, &c. It depends on the cause of the sciatica or the neuralgia how the galvanism is used, and if the cause is decided on, then the amount of galvanism applied would be, up to a certain amount, as a tonic and stimulant to a nerve which is asthenic; the cells used would be few, and the application light. But if the complaint has been caused by cold, sitting on a wet seat, gout, &c., and the nerve is tender when pressed upon, and the pain very acute, then the cells must be very much increased, and the poles pressed well into the part. The operation should be only for a few minutes, but severe. Sometimes around the cutaneous parts on which the charcoal points have been placed there occurs a herpetic eruption. If galvanism is applied in this way it is the most powerful counter-irritant possible, and the relief to the sufferer is very great.

Sometimes one has to treat cases of neuralgia caused by great debility, at other times shock, and often in two applications the patients are well. Now no medicines do this, and if any apparent benefit is obtained the stomach or some other organ suffers, as the head does in large doses of quinine. Then there is the morphia treatment by hypodermic injection. Now this line of treatment is all very well for the time being, to relieve the great pain and distress, but does it cure the malady? No. About five months ago five cases came under my notice where for months and months men had been treated with morphia injections. One man had got up to four grains and three quarters daily. If this kind of treatment is persisted in where is it to stop? the patient may as well be an opium eater. At last this particular patient got a large abscess in the gluteal region, from the irritation of passing the needle, I presume, and thus got rid of his sciatica. In the case of asthenic neuralgia I believe the mild application of galvanism not only stimulates the weak nerve at the time, but is of a lasting character, for I have often heard a patient say that the whole limb kept warm for two or three days after. I also believe that by this more or less continuous stimulation fresh nerve-cells are caused to be formed, and so the weak nerve is permanently strengthened. And the reason that faradisation is injurious in this class of complaints is that it causes contraction of the enfeebled nerve, and if used strongly a breaking up of nerve-cells, and great pain at the time,

and most likely followed by an aggravation of the symptoms. If others have been as successful as myself in the treatment of this class of complaints by galvanism, then I hope it will be tried generally, and it certainly will be a great boon to patients to have this done, instead of taking the powerful medicines some do, and after all only to ameliorate their complaint.

B. G—, aged fifty-four, a surgeon, came under treatment on June 15th, 1873. His history was that two months previous he had got wet and was obliged to sit in his damp clothes for nearly two hours. When he got home he shivered a little and felt cold all over. He went to bed, but was called up in the night and had to go to a midwifery case, at which he stayed some time. On the following day he felt much out of sorts, and in the evening had some pain and stiffness down the back of the left thigh, which, in spite of everything he could do, gradually got worse. He then consulted a well-known physician, and he was put through all the usual modes of treatment, but with little effect; in fact, in spite of very large doses of quinine and aconite liniment, he used to get worse towards night. At the end of the fifth week the pain used to get very severe, and last for about two hours, every twelve hours. He then came to me as a last resource. He walked into my room supported by two sticks. The pain he complained of reached along the left sciatic nerve, commencing just below the sciatic notch and extending to the popliteal space; he also began to feel pain in the loins.

I looked on this case as one of great congestion of the nerve, followed by effusion under the neurilemma; and the pain in the back as caused by the disease extending upwards towards the cord. I advised him to leave off all medicines so as to give the galvanism a fair trial, and to have recourse to the latter daily. I began with eighteen cells of Stöhrer's battery. After the first application he stood up and said, "I believe this will do me good; the whole limb feels warm, which, in spite of wool, flannel, &c., it has not done for weeks." After the first week, I galvanised him only three times a week, then twice; and in three weeks he said he thought he was quite well—at any rate, he would see if he could do without the galvanism; he did so, and has been perfectly well since. He took no medicine from the day he first came, and at the end of the first week left off all the wool and flannel, and only continued his ordinary merino drawers.

E. B—, aged fifty, servant, came into the hospital on February 13th, 1875. She says except an attack of congestion of the liver five years ago, she has always had good health up to nine weeks ago, when she slept in a damp bed. A few days after she was taken with great pain in the lower part of the back and down the left hip, a few days after extending down the back of the thigh and leg to the back of the ankle-joint. The pain always gets worse at night, commencing between 7 and 8 o'clock, and particularly so in wet weather. Ordered hypodermic injection of one-sixth of a grain of morphia twice daily, and ten grains of compound colocynth pill at bedtime. Broth and milk diet.

February 16th.—No better. To go on with morphia injection, and to have a mixture containing three grains of iodide of potassium, ten grains



of bicarbonate of potash, and a drachm of glycerine, to an ounce of peppermint-water.

18th.—About the same. Continue injection.

22nd.—A little better. Repeat pill, mixture, and injection.

24th.—Pain worse. Ordered a blister over sciatic nerve.

26th.—No improvement. Mixture twice daily; to be galvanised every other day.

27th.—Twelve cells from Stöhrer's continuous battery applied. Seemed to feel it a good deal.

March 2nd.—Says she certainly has less pain, and gets much better sleep since the galvanism. To leave off morphia injection.

4th.—Is better. Says the galvanism is painful at the time, but thinks it is curing her.

6th.—Is going on well. Mixture to be left off, and only ten cells to be used now. Repeat aperient pill.

9th.—Is much better. To get up to-morrow.

12th.—Pain much less. Is ordered to walk about a little.

16th.—Continues to improve; pain nearly gone. To be galvanised twice a week, and only eight cells used.

19th.—Is now convalescent; only complains of a little stiffness.

22nd.—Discharged cured. She promised to let me know if it returned; but I have heard no more of her.

E. L.—, aged thirty-two, came to me on April 15th, 1874. Said he first caught cold; and after that got very weak, and then pain slowly came on in the back of the right thigh. This was about four months ago. Before he came to me he had been an out-patient. He had marks of three good-sized blisters on the back of the thigh and hip, and several small specks could be seen on the hip and thigh. These he told me were the marks of the hypodermic needle; and stated that he had had several kinds of medicine, but they had not done him any good. Of late there was always some pain and tenderness in the back of the thigh, and then at times it would get much worse and the pain would be almost unbearable. He looked very anæmic, his tongue was slightly furred and flabby, his muscles were soft and flaccid, and he said he had lost nearly a stone in weight since he was taken ill.

I galvanised him daily, commencing with sixteen cells, "which he felt very much," and dropping two each day. In eight days he was much better—in fact, so much better that he only had the battery every third day, and only eight cells. In three weeks he was quite well, and went into the country. I have seen him repeatedly since, and he has had no trouble up to the 15th November last, when he caught a severe cold and got wet; and he had, he said, suddenly found the pain return the day before his call. I applied twelve cells three times every other day, and that quite got rid of it. This is the 1st December, and he has had no return.

I believe in the first instance this case was purely of the asthenic form, from the wasting of the limb, the constant wearing pain, and the slowness with which it came on. In the second instance it was different in character; there was great tenderness along the course of the nerve, and the pain was of a more shooting character. This, then, was of the congestive form.

Mrs. L.—, aged thirty-eight, came to me April 10th, 1874. She was a thin, delicate person, looked pale and weak, pulse feeble, bowels constipated, appetite bad, nights restless. She said she had had a great deal of trouble and grief during the past month, and ten days before coming to me she was taken with pain in the right side of her face, and down the neck to the clavicle; it was nearly constant, but increased at night, and each day it gained in intensity. The pain seemed very general over the whole side of the face and neck.

I applied six cells of the continuous battery, the charcoal points being covered with lint and dipped in salt and water. I applied them for twenty minutes all over the part affected, and at the end of that time she said, "Thank you; the pain is gone now." She then told me that whenever she was weaker than usual, or worried, she always had neuralgia; and she had tried medicine over and over again, and although it set her right it took days to do so; but whenever she could get the battery applied it cured her at once.

I have no doubt this was a case of asthenia of the nerve, causing pain, and at once relieved by a stimulant tonic, galvanism.

T. D.—, aged thirty-one, came under treatment on the 15th Feb., 1875. This was a very chronic case, having, he said, suffered for over two years, without hardly a day's intermission. When first taken with pain in his hip and thigh he had tried a very great many kinds of treatment, and had seen a good many medical men, but for the last twelve months he had done nothing but have morphia injected night and morning, and when the weather was very wet and the pain worse, he had it done three times a day, and had got up to four grains of the acetate of morphia per day! I reduced the morphia to two grains a day, and after ten days left it off altogether, and he never returned to it regularly, but he had to be about a good deal in all weathers, and four times he had a slight relapse for a day or so, and I gave him half a grain at bedtime.

I commenced to treat him with twenty cells of the battery, and pressed it well against the thigh, and after the first week I gradually lessened the strength until I got down to eight cells. He slowly improved, and at the end of two months he was very much better, and went into the country, and that completed his cure. The treatment had not quite fair play, as the man had to go out in all weathers at five o'clock in the morning, and besides this, to keep the cold out, he took a goodish drop of whisky.

I believe in this case there was effusion into the sheath of the nerve, for there was commencing numbness down the leg and foot, and the whole limb was beginning to waste.

J. N.—, aged fifty-four, came under treatment April 15th, 1875. He complained of great debility, especially in the right leg, which at times gave way under him, also of pain in the front of the thigh and all around the knee, and at times in the leg. He had heard of electricity he said, and that it would do him good, so he went and got faradised; but it increased the pain he thought, and he only had it done twice.

I commenced with six cells of the continuous current every other day, and this did him so much good I did not increase it. At the end of the second week the pain was nearly gone, and



the only thing he complained of was weakness of the limb, but gradually the strength and size came back.

This seemed to me a marked case of asthenia of the nerve. And so the faradisation increased the pain by giving a shock to, and causing contraction with spasm of, the enfeebled nerves, and most likely breaking up some nerve-cells instead of causing the formation of fresh ones as the galvanism does.

Barwood-place, Hyde-park, W.

#### NOTES ON

### THE ADMINISTRATION OF ALCOHOL IN THE TREATMENT OF DISEASE.

By BENJAMIN W. RICHARDSON, M.D., F.R.S.

I CANNOT, I think, begin the work of the new year more usefully than by recording a few observations on the employment of alcohol in the treatment of disease.

In the earliest part of my professional career—twenty-five to thirty years ago,—the lessons taught in the English and Scottish schools were very simple and, admitting the premises on which they were based, sound. They were the continuation of a wave of the Brunonian theory, though the name of the theory and much of its curious history had become entirely forgotten. The value of alcohol was thought to lie in its power of sustaining the animal body during “asthenic” states, and of saving the body from exhaustion of its “excitability.” Alcohol, therefore, was administered, with moderate freedom, in cases of general dyspeptic debility; of hæmorrhages; of fever, when the pulse was failing in power; of syncope; of shock; of exhaustion from a discharge from the body, as from an abscess, or from free secretion of milk in the woman; of depression from severe inflammatory states, as in carbuncle or erysipelas; of melancholic, depressed, and nervous states of mind; of phthisis pulmonalis; of hysteria; of delirium tremens; of paralysis. It was administered in all cases in which it was considered that the patient would be likely to sink, or in which the patient was thought to be actually sinking into death. The universality of the remedy, as an aid to substances more purely medicinal, was, in fact, admitted by nearly every practitioner.

A little later, the employment of alcohol in medicine became, I will not say more systematic, but more extended. The teachings of Dr. Todd led many practitioners to “rely,” as they expressed it, on alcohol, to the exclusion, in some instances, of all other active treatment. For my part, I was never drawn into the practice of this extreme school; but for more than twenty years I held by those lessons which I originally learned from my first masters.

Within the past six or seven years a change has come over the medical world in respect to the value of alcohol as a remedy. This change is due to the new light that has been thrown upon the subject of the physiological action of alcohol. I do not now enter on the physiological question. It is sufficient for me to say that, without any kind of prejudice against alcohol as a remedy, with in-

deed some prejudice in its favor, I have felt it a duty to study its medicinal action in a more critical spirit than I did originally, and that the result is a correction of many errors of grave import. Thus I have learned a series of new truths and practices in the treatment of disease which I would submit as being worthy the consideration of those who have not yet arrived at the same conclusions.

To some of the changes of practice I have been led solely by physiological guidance; to some by the process of following and testing the practice of other physicians who have ventured to move in steady advance in the path of clinical research.

Of the new facts which I have, so far, learned from new observation, the following are the most important.

#### I.

There are cases, commonly called cases of debility, in which there is no objective sign of organic disease. The leading symptoms are those of persistent dyspepsia; flatulency; irregular action of the bowels; hæmorrhoids; much exhaustion under moderate physical exertion, and great mental depression under slight mental disturbances; extreme nervous excitability, amounting to hysterical excitement; a condition of urine variable in character, the fluid sometimes of straw color and abundant, at other times scanty and loaded with lithates; the sleep disturbed, with frequent movements and muscular starts of the lower limbs at the moment of going to sleep; a deficient appetite, and a white loaded tongue. In these examples—as common, by the way, to-day as in former times—the old practice used to consist in trying “to regulate” the wine or other alcoholic beverage. My experience now is that these symptoms are in nearly every instance caused by alcohol, and that the only certain successful treatment is total abstinence. To the practical conclusion here stated I have been led by the study of the action of alcohol upon the healthy body. The phenomena described are the symptoms of alcohol when it is taken in what is commonly presumed to be a moderate, and, as it has seemed to many, a necessary quantity. These phenomena and their cause have been very carefully and ably described by Dr. Marcet.

#### II.

That alcoholic stimulation was the first point of practice in the treatment of acute hæmorrhage was a lesson of all others most impressed on my student life. For many years I held by it, as a matter of faith, so strongly, that if in a fatal case of hæmorrhage I had been obliged to withhold the stimulant I should have looked back upon the proceeding with sincere regret. At the same time some striking facts were occasionally presented to me, which startled me at the time, and which would have taught to a mind less forcibly impressed with a preconceived idea a new experience. I was called at night to see a weak and emaciated woman who had been attended by a midwife, and who had been flooding for several hours, owing to retained adherent placenta. The woman was semi-conscious, occasionally feebly convulsed, and cold, from the loss of blood. If wine, sherry or port, had been at hand, I should have given her half a bottle at least, or any other form of alcohol in like proportion; but there was not a drop of alcoholic drink in the house, and the house was some miles

from a village, so I was obliged to get on without the stimulant. I extracted the placenta, kept up firm pressure on the uterus with the hand, and administered freely the only sustenance that could be had—viz., milk diluted with water and sweetened with sugar. The hæmorrhage stayed, the patient fell into a sleep, and I left her in the early morning comparatively safe. At a visit later in the day she was in a condition as favorable as I had ever seen for recovery under like circumstances, and she actually recovered as quickly as could be imagined possible, without taking a single dose of alcohol. This recovery was backed by many others; by the recoveries from exhaustion after venesection without administration of alcohol; by the recoveries of the inferior animals from hæmorrhages carried up even to apparent death. They did not teach me anything more than a list of curious exceptions from an imaginary rule.

Meanwhile it was impossible to be blind to another set of facts—namely, that the alcoholic remedy for hæmorrhage, potent as it might be, was not without its disadvantages. It caused generally a reaction more or less troublesome; and sometimes, during the reaction, hæmorrhage recurred. It caused often an extreme, restless nervousness of the patient. It deranged the secretions. It lessened the appetite for sustaining foods, and it led thereupon to an exhaustive, feverish condition,—famine fever,—which was not satisfactory. Lastly, it was by no means so invariably successful a remedy as might be desired and expected. These drawbacks, however, pertain to many remedies; indeed, not one remedy is certain, not one perfect. Alcohol therefore, like the rest, must be accepted with all its imperfections on its head.

Gradually, under the light granted by physiological research, I began to discover that alcohol was clearly objectionable as a remedy for hæmorrhage. To check the loss of blood from open vessels something is wanted that will either produce rapid coagulation of blood, or that will cause contraction of the bleeding vessels. To push alcohol generally to the extent of causing coagulation of blood in the bleeding part were to push it to the extent of causing coagulation of blood within the heart, a feat not exactly to be desired even for the arrest of a hæmorrhage. It does not therefore answer for the first purpose. To push alcohol so as to make it act on the vascular tension was, I found, to push an agent which relaxed the vessels and let them more easily give forth their blood. It does not therefore answer for the second purpose. Alcohol has another effect, which up to a certain degree, may be useful in cases of loss of blood, but which carried a very little further than is useful is injurious. I mean the effect it exerts over the heart. Under the action of alcohol the stroke of the heart is quickened, and thus in the moments when the impelling, or what we at present call the impelling, force of the heart is low, an increased movement is produced which may possibly be temporarily restorative. Unfortunately, it is necessary to keep up the quickened action by giving more of the restorative, and if the over-action induced be uncontrolled, it becomes hurtful; it prevents in the bleeding surface that stasis of blood which is so necessary to ensure a firm clot, and it keeps up an excitability of the brain and of the nervous system generally which is opposed to recovery.

The consideration of these facts led me to question the propriety of administering alcohol for the cure of hæmorrhage. The doubt, suggested by reasonings resting on physiological observation, was before long tested in practice.

I was asked to visit a lady who for many hours had been suffering from hæmorrhage after the extraction of a tooth. I found that the cavity of the tooth from which the blood flowed had been several times firmly plugged with cotton saturated in a solution of perchloride of iron. By this means the bleeding had for a period been stanch, but it as constantly recurred, forcing out the plug. During the time brandy had been frequently administered, in order, as it was assumed, to keep going a heart which flagged speedily when the stimulant was long withheld. I found the patient scared, prostrate, and restless; the action of her heart rapid and feeble; the bleeding from the cavity free. When I attempted to examine the mouth she vomited, throwing up some blood that she had swallowed, with fluid matter—a part of the last drink she had taken. After this she became faint, and I then succeeded in filling the cavity with styptic colloid on cotton-wool, plugging firmly from the bottom of the cavity, particle on particle, as a dentist stops a tooth with gold. The hæmorrhage once more stopped. I insisted on the withdrawal of all stimulant. I placed the patient recumbent, got her to swallow slowly a good draught of warm milk containing a little lime-water, and allowed her to recover from the faintness without any enforced reaction. The result was all that could be desired. The hæmorrhage did not return, and when the plug came away a few days later there was a firm healing surface beneath. The strength of the patient was rapidly restored.

From this time onwards I have substituted warm milk for alcohol in every case of hæmorrhage I have been called to treat, and I am satisfied that the new treatment is safest and soundest. I give one more illustrative example because of the extreme character of the symptoms.

I was called urgently in the night to meet my friend, Mr. Milson, of St. John's-wood, in the case of a gentleman who was bleeding profusely from the roof of the mouth. The patient was suffering from specific disease affecting the palate and superior maxillary bones; the bony part of the roof of the mouth was, indeed, a necrosed shell. Through an opening in this dead bone, arterial blood began suddenly to pour, and by the time that we arrived five pints of blood, as I found by after measurement, had been passed into one basin, while much more had been lost which could not be measured. We lifted the fainting man from his bed on to a couch so as to get at the mouth more readily, and we at once firmly plugged with styptic colloid and cotton-wool, after passing styptic ether, by the spray tube, freely into the bleeding cavity. In this manner we stanch the bleeding completely. We gave the patient warm milk, but no stimulant. At this juncture we had the advantage, and what is always an unqualified pleasure, of a consultation with Mr. (now Sir) James Paget. He advised that our firm plug should be left in its place, and he independently and earnestly supported our practice of withholding alcohol. Four days later, owing to the separation of the plug, the hæmorrhage recurred as profusely as before, and a new plug would not hold.

I therefore, in *extremis*, cut round the margin of dead bone with a dentist's saw, and turned out the necrosed structure altogether. Then we were able to see and secure by torsion two bleeding arteries— anterior palatine or branches from them,—and by further use of styptic spray and plug again stanching the bleeding, this time for good, but not until a further loss of at least from five to six pints had been sustained. We followed once more the plan of feeding with milk and of withholding alcohol altogether, and with a success that was without a check. The symptoms of fever, of reaction, of dyspepsia, of nervous restlessness, of sleeplessness, were all saved; the wound healed soundly, and the return of strength progressed rapidly to perfect recovery.

(To be continued.)

#### ON A CASE IN WHICH IRRITABILITY OF THE FEMALE BLADDER OF FIFTEEN YEARS' STANDING WAS CURED BY DILATATION OF THE URETHRA AND NECK OF THE BLADDER.\*

By H. BENDELAOK HEWETSON, M.R.C.S.

THE notes of the case I am about to relate are of extreme importance in connexion with an operation, still on its trial, introduced by Mr. Pridgin Teale, and but recently published,† which comprises dilatation of the urethra in the female for the relief of irritability of the bladder, and, as in this case, occasional retention of urine. The absolute success attendant upon its performance in some cases, and its partial, if not complete, failure in others, render it incumbent on us to keep strict records of the symptoms, general as well as local, which affect females the subjects of irritable bladder upon whom this operation is performed. The extent to which the dilatation of the urethra is carried should especially be noted, since the partial or complete failures may possibly be the result of too cautious stretching from fear of producing incontinence of urine. Moreover, the general symptoms must be taken into account, for it may be that it is upon them the surgeon is consulted, without the slightest reference being made (as this case will show) to the more delicate point of irritability of the bladder; when it is upon the latter trouble that the general malaise depends.

Following are the notes of the case:—

Miss M—, aged thirty-six, sent for me on the night of March 3rd, 1875. On arrival at her home, I found her to be suffering intensely from retention of urine. I relieved her (by the use of the catheter) of a large quantity of urine, such an amount as must have distended the bladder nearly if not quite up to the umbilicus. This point I did not test, being anxious to relieve her without delay from the worst agony of retention. The retention returned in a day or two, and I had again recourse to the use of the catheter.

Her previous history is as follows:—That she was a perfectly strong and robust woman, follow-

ing the *arduous* duties of a "present day" school-mistress until fifteen years ago, when she was seized with an inflammation of the bladder, for such it was termed by her medical attendant. This was followed by the formation of a small abscess in the region of the urethra, which discharged of itself. Since that time her health has been bad, preventing the continuance of her calling. She states that since her recovery from this attack, her nights have been wakeful and disturbed by being constantly "every half hour or hour" obliged to get up to pass small quantities of urine with great effort and some pain. She is low and depressed, with almost constant headache, loss of appetite, and continual bearing down, resulting in a total unfitness for prolonged exertion of any kind. She has lost flesh considerably, and has for several years been set down by her numerous friends and medical advisers, to whom she had made no reference to her urinary troubles, as a confirmed invalid. These symptoms were complicated a year ago by pain in passing the motions, which were infrequent and confined. She had not been seized by retention of urine previous to March last. In February last she was, with "questionable propriety," advised to come to Leeds to stay with some friends for the good of her health.

On examination I found the orifice of the urethra to be completely surrounded by warty growths of a considerable size, and on examining the rectum the introduction of the finger was impeded by a very tight sphincter ani. The rectum was baggy, and there was a small external pile. The uterus was in its natural position, and the catamenia were, and had always been, regular, and the urine was natural. Not being able to estimate to what extent the retention was due to the warty growths, and seeing she was suffering considerably from rectal difficulties, I deemed it advisable to negative the possibility of the retention being caused by the warty growths by removing them, and whilst the patient was under the influence of an anæsthetic stretching the sphincter ani with the forefingers introduced back to back sufficiently forcibly to paralyse it for a time and allow the sore produced by the snipping off of the pile to heal; in the same way as one would cure a fissure of the anus, by setting the spasm of the sphincter ani at rest, which, constantly contracting, might possibly be an element, through reflex action, in helping to keep up the vesical irritability.

Accordingly, on March 5th, chloroform having been administered, I completely carried out the above suggestions. The result of this was, that during the next few weeks relief was given to the retention of urine and to the pain in passing the motions; but there was no relief at all from the vesical irritability. Her general condition, with these exceptions, continued as before, and there was a return of the retention of urine at the end of three weeks from the operation.

I had clearly told her a second operation would possibly be necessary should the first fail to give relief, and accordingly, on April 11th, I again placed her under the influence of chloroform, and introducing Weiss's female dilator into the urethra to the extent of about two inches, I then *slowly* separated the blades of the dilator, stretching the urethra so as to admit of the introduction of my forefingers within the bladder while the parts were on the stretch. On closing the blades and withdrawing the instrument, the urethra contracted

\* Read before the Leeds and West Riding Medico-Chirurgical Society, Oct. 1st, 1875.

† Vide THE LANCET, February number, 1876.

upon my little finger, so as sensibly to grip it when introduced into the bladder, the coats of which were thickened. There was no foreign body or stone to be detected.

She was very much upset by the chloroform-sickness, which continued more or less all night; there was, however, *no more irritability of the bladder, no retention, no incontinence produced*, and, to use her own words, "I have not passed water so freely for years"; nor had she retained it so long without being disturbed, for the first time she made water was in the evening after the operation, and she was not disturbed during the whole night.

April 14th.—She slept the night through, and awoke with little or no headache, retaining and passing her water quite naturally with the exception of some soreness.

16th.—She complains of slight pain while passing water, but perfect facility.

19th.—She got up in the evening complaining of none of her former symptoms, having lost completely all trace of vesical irritability in eight days from the dilatation of the urethra.

Her progress now continued to be satisfactory and very rapid.

May 4th.—She reports her old symptoms to have all disappeared. She sleeps and eats well, and takes a fair amount of exercise.

At this stage I ordered her into the country, where she resides, and returning on May 31st, she reported herself as perfectly well, and has gained three stones in weight. On the day previously she had walked a distance of eight miles without feeling more than ordinary fatigue, and remarked that before the operation "she could hardly trail herself about."

Thus, then, were the miserable and intractable sufferings of years, shutting out this poor woman alike from society and employment, put an end to at once by an operation whose best recommendation is its simplicity and its success.

Leeds.

## INTRACRANIAL ANEURISM.

By WILLIAM E. HUMBLE, M.D. Lond.

I AM glad to be able so soon to forward, according to promise, an account of the termination—and, I rejoice to say, successful termination—of the case of intracranial aneurism which was published in *THE LANCET* for Dec., 1875. The fact of its course having been carefully watched from the commencement, and the very interesting and distinct phenomena which attended the consolidation of the aneurism, render the case one deserving of record, and its successful issue affords encouragement for a future trial of a similar mode of treatment.

It will be recollected that the first symptoms of aneurism occurred in March, and the disease, which was at first diagnosed as a case of some kind of tumour at the base of the brain, was recognised to be aneurism at the cavernous sinus about the end of May or beginning of June.

The aneurismal bruit was first heard by the patient on the 17th of March, and by myself, by

means of the stethoscope, at the above-mentioned time. The operation of ligation of the carotid having being declined by the patient, and it being found impracticable to carry out fully Mr. Tuffnell's method of treatment by absolute rest and restricted diet, I determined on adopting Dr. Balfour's plan of treatment by iodide of potassium. On the 26th of June she began with nine grains of the iodide daily, and the dose was regularly increased till she took thirty-six grains daily. This treatment was steadily continued for just four months, and it is noteworthy that these large doses of the iodide (from Apothecaries' Hall) produced no appreciable symptoms whatever, the patient improving in general health and stoutness.

During the whole of this time the aneurismal bruit continued without intermission, varying in loudness somewhat according to the force of the circulation, and much resembling the sound of a cardiac valvular murmur. About the latter part of September it became louder and rougher for a week, but then subsided to its former intensity. For the last fortnight preceding its cessation I fancied it was not quite so loud, and rather softer than it had been. During the last two months the strabismus diminished, but there was more neuralgia of the brow and side of the head, and she used to complain of the pressure of the stethoscope. The improvement in her general health has been observed by all her friends.

On the morning of October 21st, I was sent for hurriedly at 9.30 A.M. She told me she had had a bad night, the aneurismal bruit having been very loud. She was taken during the night with vomiting and purging, with some headache. The vomiting was attended with much urging, and she was purged, she says, between twenty and thirty times. About 6 A.M. the aneurismal sound became different and constantly varying, at times resembling clanging wires. It then became very feeble, and she heard what resembled several cracks. She then felt very strange, and was astonished at everything appearing unusually silent, when she observed that the sound had ceased. When I saw her no bruit whatever could be heard. She was a little pale and weak, partly from the bad night, and partly because she feared some serious change for the worse had occurred. I explained to her that probably the wished-for event had occurred, and that the first step towards consolidation of the aneurism had been gained. I prescribed some medicine to stop the sickness and diarrhoea, and enjoined the greatest quietude in the recumbent posture, but with the head raised. The right side of the head was very tender, so that she complained very much of the pressure of the stethoscope. This neuralgic condition has existed more or less for some weeks.

Oct. 22nd.—Passed a tolerably good night. No return of the bruit. Says that for about an hour to-day she had slight throbbing within the head. Complaints of a strange sensation in the neck and front of the chest, especially if she laughs slightly. No murmur can be heard. Right side of the head still tender, and slight noises, as the opening or shutting of a door, annoy her. Some headache. Says how strange the silence appears to her after seven months and a half of loud pulsation. Iodide to be continued in half the quantity.

24th.—Has suffered more from headache, but not severely. Says she has experienced slight throbbing on the other (left) side of the head. No

bruit heard. Pulse continues rather weak, but otherwise normal. Will not remain in bed as advised. The squint has nearly disappeared.

From this time she continued to improve. The throbbing continued for a time in the left side of the head, and was explained to her to be no doubt owing to the artery on that side being enlarged to compensate for the impervious state of the diseased one. She now (Nov. 26th) continues quite well, except some neuralgia. The throbbing has ceased. No bruit has been heard since its cessation on the 21st of October, and I imagine that, five weeks having elapsed, the cure may be considered complete.

Corfe Castle, Dorset.

### NOTE ON AN ETHER INHALER.

By MARTIN OXLEY, L.K.Q.C.P.,

Physician to the Liverpool Infirmary for Children.

When in New York this autumn, Dr. Emmett, surgeon to the State of New York Woman's Hospital, showed me an ether inhaler which is the invention of Dr. Allis. It seemed to me at first sight to be the best contrivance for the administration of ether that I had seen, and on trial I have found it quite as perfect as I expected. Its advantages are these:—The ether being very thoroughly mixed with air, the patient does not suffer from the suffocation usually felt at first inhaling; there is a large evaporating surface. A very much smaller quantity of ether is used, and less escapes into the room than with the usual mode of giving this anæsthetic; the ether can be dropped from a bottle on the distal end of the inhaler, without removing it from the face; the mask is soft and pliable, fitting accurately to the nose and mouth; and, lastly, it is of very simple construction, and cannot get out of order.

I have given the inhaler a very fair trial, and can confidently recommend it. Mr. Wood, of 81, Church-street, Liverpool, has made a few from the pattern of the one I bought in New York, and has had the framework electroplated. The inhaler



A. Bandage.

B. Frame.

C. India-rubber sheeting.

D. Edge of bandage.

consists of two stout oval frames which are joined together by wire bars three inches long and about one-eighth of an inch apart, making a sort of small birdcage open above and below; through these bars a bandage is threaded, so as to fill up the inside of the cage, the edges of the bandages presenting at its open ends; over this frame is drawn

a piece of stout sheet india-rubber, which has been stitched together at the edges, so as to make a covering for the frame, projecting over one end two inches, to form the mask, and at the other one inch. The ether is poured on the bandage, which forms a close, well-made artificial sponge.

Rodney-street, Liverpool.

## A Mirror

OF

## HOSPITAL PRACTICE, BRITISH AND FOREIGN.

*Nulla autem est alia pro certo noscendi via, nisi quamplurimas et morborum et dissectionum historias, tum aliorum, tum proprias collectas habere, et inter se comparare.*—MORGAGNI *De Sed. et Caus. Morb.*, lib. iv. Proœmium.

### HOPITAL ST. LOUIS, PARIS.

SMALL SARCOMA OF THE ORBIT; EXOPHTHALMIA;  
ENUCLEATION OF THE EYEBALL; ERYTHELMA;  
DEATH; AUTOPSY.

(Under the care of M. PÉAN.)

J. B—, aged twenty-seven, was admitted Sept. 8th, 1875. He was a well-nourished and healthy-looking man. His family history was good, and he denied ever having had syphilis. In the month of May, 1871, while a soldier, he had acute double conjunctivitis. This attack was soon cured by appropriate treatment. Three or four months later on his friends noticed that his right eye protruded rather more than his left one. This protrusion, however, caused him no inconvenience, and his sight remained equally good in both eyes. At about this time he attended at the Val de Grâce Hospital, where he was put under treatment by Dr. Perrin, consisting of iodide of potassium and mercurial frictions. His condition was not ameliorated after this treatment, and from that moment his eye became more and more prominent.

On admission the eyelids were red and inflamed, but there was no œdema. On the right side the eyelids were still capable of closing over the globe. The patient had command over the extrinsic muscles of the eyeball, which acted well. The conjunctiva was highly injected, and there was slight œdema at the internal angle; cornea healthy; size of pupil normal; the iris contracted well under the influence of light. The patient could count fingers at six inches, and he could read No. 12 Jäger. The pharynx and the nasal fossæ presented nothing abnormal. The general health was good.

Sept. 12th.—Being unable to obtain satisfactory knowledge as to the nature and the cause of the mischief, M. Péan made a curved incision, parallel to the border of the eyelid. On introducing the finger into the incision, a tumour of small dimensions, and rather hard, was felt resting upon the floor of the orbit, in the vicinity of the sphenoidal fissure. No liquid of any kind could be drawn from it.

A hard tumour, probably of a fibrous or fibro-

plastic nature, of the floor of the orbit was diagnosed.

It was decided to extirpate the tumour and to enucleate the eyeball at the same time. Accordingly the former incision was prolonged, and the whole eye, with the tumour, was taken out, the periosteum alone being respected. In the course of the operation M. Péan made use of his "hæmostatic pincers," which rendered valuable service, drawing down the eyelid by their weight, and compressing the cut arteries at the same time. The two eyelids were brought together and fixed by means of a metallic suture, after the orbit had been filled with sponges.

During the operation it was noticed that the tumour was quite independent of the eyeball and of the optic nerve. It appeared to adhere intimately to the two borders of the sphenoidal fissure, and seemed to penetrate into the cranial cavity. It was surrounded by adipose tissue. Upon microscopical examination it was shown to be a simple fasciculated sarcoma.

Sept. 13th.—General condition satisfactory. No rigors. Temperature in rectum 100° F.

14th.—Well-marked blush all around base of orbit. Headache. Shivering fit which lasted five minutes. Pulse 90; temp. 100·8°.

15th.—Well-marked erysipelas. Ordered a purgative, and a liniment composed of equal parts of turpentine and ether to be rubbed on the face.

16th.—Erysipelas shows no tendency to spread; oedema of the eyelids of the left eye. Pulse 100; temperature 102·2°.

17th.—Fluctuation in right temporal region. Pus allowed to flow out. Loss of appetite. Subdelirium at night. Pulse 90; temperature 102·2°.

21st.—One of the sutures taken out to allow a freer exit to the pus. Pulse 100; temperature 103°.

23rd.—Very agitated. Cries out and writhes in his bed. Discharge very considerable from the orbit. Pulse 104; temperature 103°.

25th.—Delirium during night; noisy breathing, rigors, and floccitation. During the night the patient was attacked with hemiplegia of the whole of the left side. Pulse 108; temperature 104°.

26th.—Died at 6 o'clock in the evening.

*Autopsy, thirty eight hours after death.*—A purulent collection was found in the temporal fossa communicating with the cavity of the orbit, and the periosteum was lifted up at the antero-external angle. The roof presented a black tinge, and every here and there small abscesses were formed, of about the size of a pin's head. On the brain being taken out, a layer of pus of about one inch in thickness was found under the dura mater. The whole sphenoidal lobe was found to be soft and fluctuating. In the interior of this lobe there was a small abscess which communicated with the exterior pus. In the frontal lobe there was another large abscess occupying the white substance of the three frontal lobes, and reaching back as far as the anterior extremity of the corpus striatum. The remainder of the brain was healthy, as were also all the organs of the chest and abdomen. The outer wall of the orbit was found to be excessively thickened, owing to a periostosis of the three bones which form this wall. The optic nerve was very slightly injured. This periostosis of the outer wall explained the considerable projection of the eye, which was not entirely due to the sarcoma.

*Remarks.*—M. Péan, in telling his audience how hard it was sometimes to come to a true appreciation of the determining cause in cases of exophthalmia, pointed out that in this particular case the slow march of the disease, the absence of all pain and of any inflammatory process, the general health of the patient, and the fact of the pharynx and the nasal fossæ being healthy, had permitted him to lay aside all other suppositions, and to diagnose the presence of a retro-ocular tumour. He considers that in these cases it is almost always better to enucleate the eyeball at the same time as the tumour, as the position which these generally occupy renders surgical manœuvres extremely difficult, and exposes the patient to greater risk of the recurrence of the mischief, as part of the tumour may be left behind.

## LONDON HOSPITAL.

### CASES UNDER THE CARE OF MR. MAUNDER.

THE following cases were submitted to operation on the 1st December, 1875; and are reported by Mr. J. Job, house-surgeon.

*CASE 1. Stricture of Urethra; "immediate treatment."*—This case was that of a man twenty-seven years of age, who suffered from stricture which had caused retention for the third time during the last two years, and which led him to the hospital on Nov. 8th. Catheterism having failed, Mr. Job administered croton oil and a warm bath, with the desired effect. After a few days' rest in bed, Mr. Maunder succeeded in passing a fine catgut bougie. This was retained for three days without the least discomfort, and soon No. 6 catheter could be introduced. At this stage an unsuccessful attempt was made to pass an instrument, and a very severe rigor, attended by a temperature of 105°, followed. To remove irritability and prevent a repetition of rigor, treatment by "immediate dilatation" was determined upon. A No. 3 catheter and then the dilator were insinuated, after some little difficulty, through the stricture; and this latter was split so as to admit of the bladder being emptied by a No. 10 catheter—the largest the meatus would admit.

Mr. Maunder remarked that in a very large majority of cases of stricture, gradual dilatation by the catheter and bougie sufficed for the patient's relief, and it was only in comparatively rare instances that more decided operative interference was requisite—a circumstance which must be very evident, as, notwithstanding the large number of patients so suffering admitted into the hospital, few required more. After discussing the merits of the case, and the *modus operandi* of Holt's dilator, he desired to draw especial attention to the great value which he set on this method of treatment, and expressed his surprise that some surgeons were dissatisfied with the result of the operation. He had had a fair experience of it in both hospital and private practice, the latter very much among a class of gentlemen, who were not always the best subjects for any operation, and yet among such his experience was eminently encouraging. His custom was to advise a patient who was to be submitted to this operation to arrange to take ten days holiday, though in very many instances three days were enough. Under these circumstances he

would perform the operation on a Friday, and his patient would often be able to return to business on the follow Monday. At the present moment he could only recall two instances in which the operation had not answered his expectations. One was that of a young man whose urethra was encroached upon by a great deal of hard, inflammatory exudation, to which the operation was inapplicable, and must therefore not be charged with the failure, and who was quickly cured by external urethrotomy. The other, that of a gentleman about fifty-two years of age, the subject of a very tight and irritable stricture, and a patient of Dr. Dove, of Pinner. The stricture was split to the full extent, but it soon relapsed, and never after could be dilated beyond No. 8.

The patient has had no more rigors, has progressed uninterruptedly well, and is highly satisfied with the result of the operation.

**CASE 2. Cleft palate (congenital) in a boy aged four.**—The gap in the hard palate extended nearly to the anterior palatine foramen, was moderately wide, and Mr. Maunder expected to have no difficulty in closing the whole by two operations, taking the soft palate first. He said he preferred this method of proceeding, so that the child might not lose much blood at one time, as might otherwise be the case, and might possibly prevent ready union. The vivified edges of the soft palate were brought together after section of the levator palati muscles from behind. The anterior pillars of the fauces were also snipped across. The operation would be completed at a future time. Here, as in all operations on mucous membrane in which swelling quickly arises, the caution was given against drawing the stitches tight.

Dec. 11th.—The edges of the soft palate had united.

**CASE 3. Indolent Ulcer.**—A delicate-looking, ill-developed woman, twenty-nine years of age, was the subject of an indolent ulcer just behind and above the outer ankle. The sore was surrounded by unyielding scar tissue, and had resisted treatment both prolonged and varied.

After explaining the process of healing by granulation, and the principle of the operation suggested by Mr. Gay, Mr. Maunder made an incision through the integument about three inches in length, and parallel with the long axis of the sore.

Dec. 11th.—Already granulations are arising, and the sore is even narrower than it was. The new wound is healthy.

**CASE 4. Talipes Equino-varus.**—A child, two years old, was the subject of this congenital deformity. Mr. Maunder explained that he should divide then only the anterior and posterior tibial tendons, leaving the tendo Achillis uncut for the present, in order that the process of abduction and rotation of the foot may be facilitated while the heel is firmly fixed by its tendon. He pointed out that, as a general principle in tenotomy, the knife is to be introduced between the tendon to be cut and any important organs, such as vessels and nerves, adjacent; the edge of the knife is thus directed away from them.

## BRISTOL GENERAL HOSPITAL.

### CASE OF PARACENTESIS PERICARDII; RECOVERY.

(Under the care of Dr. BURDER.)

THE fact that the operation of tapping the pericardium for the removal of effused fluids is still *sub lite* renders the record of every case in which this operation has been performed peculiarly valuable and interesting, whatever the ultimate issue. In the subjoined case the benefit derived from the treatment was marked, and it is scarcely too much to say that the patient's life was actually saved by drawing off the serous fluid, which was found to measure forty-two ounces.

For the notes of the following interesting case we are indebted to Mr. Thomas Elliott, M.B., late house-surgeon.

John M—, aged sixty, a carpenter, was admitted on April 26th, 1875. Forty years ago he had rheumatic fever, and again two years later. His heart, he stated, was affected two years prior to the first attack. After these illnesses he enjoyed very good health till the close of the year 1874. He served as an "army carpenter" out in the Crimea, where, to use his own expression, he had "a lot of rough work." A month before Christmas, 1874, he was confined to bed for a week with rheumatism. For the two months prior to admission he had been "complaining," and troubled with a cough, and two weeks before admission his feet and legs began to swell.

On admission there was general anasarca, shortness of breath, and a feeble pulse. Heart-action rapid and irregular, with an indistinct systolic mitral bruit. Lungs anteriorly resonant, posteriorly resonant at right base, dull at left base; respiration exaggerated over right side, tubular at left base.

On April 28th the patient was much worse, apparently moribund. Breathing very oppressive, and could only be carried on when the man was lying on the left side, and slightly on his face. The face was of a livid color; veins in neck full and tortuous, but not pulsating. Heart's apex could not be seen or felt; area of dullness greatly increased, but difficult to define on account of external cedema. The sound were very distant and indistinct, almost inaudible. Lungs resonant anteriorly and at right base, dull at left base; respiration exaggerated over right side, tubular at left base; no appreciable difference between the two sides in conduction of voice sounds.

From these symptoms and signs Dr. Burder concluded that the patient's great and immediate distress was due to dropsy of the pericardium, and that therefore paracentesis should at once be done. The operation was performed by the house-surgeon (Mr. Thomas Elliott) by means of Dieulafoy's pneumatic aspirator, the needle being inserted between the fifth and sixth ribs, and an inch to the right of the nipple. Forty-two ounces of clear, pale, straw-colored fluid were drawn off. Towards the close of the operation the apex of the heart was felt to strike once or twice against the needle, but it ceased on placing the needle more horizontally. It is here worth stating, especially from a practical point, that for cases of paracentesis the needles of the aspirator might with advantage be graduated. At times it is extremely difficult to estimate how far the needle has penetrated, as it



was in this case, where there was a considerable amount of external oedema.

The patient expressed himself as easier after the operation, but it was not till some hours after that there was any marked improvement.

On April 29th the patient looked much better; the face was of a better hue, breathing much easier, and he could lie on either side or on his back. Respiration 50 per minute; pulse feeble. Dulness over base of left lung diminished, and not extending so high upwards. Respiration over same region much more audible, with some moist sounds. Area of heart's dulness definable, sounds not so audible as immediately after tapping. On April 30th the improvement was greater, the pulse was much stronger, and the general anasarca had gone down a good deal. On May 2nd he said that he had slept but little the last two nights, on account of continued coughing, but the next night he slept much better. On May 3rd he could lie on either side, but said that if he did so he must be well over on his face, but he preferred lying on the left side. Heart-sounds indistinct; lower extremities more oedematous.

From this time he continued to improve, and on May 31st the dropsy had entirely disappeared and the heart's apex could be seen and felt beating about an inch below the left nipple. The area of dulness was definable and greatly diminished; the sounds were louder, and an indistinct bruit, apparently louder towards the base, but not carried up along the large bloodvessels, could be heard. There was still a line of dulness posteriorly at right base, where also the respiration was feeble. After this he sat up daily, but if he made any exertion he suffered at once from dyspnoea and palpitation. The heart's beat was less distinct and was more to the outer side of left nipple than before; sounds irregular and confused.

On July 6th he was discharged as an out-patient, much improved and able to move about more freely.

## Medical Annotations.

"Ne quid nimis."

### AN ANCIENT EGYPTIAN WORK ON MEDICINE.

EBERS, the German archæologist, has made an interesting discovery of what is said to be a portion of one of the lost Hermetic books of medicine. Hitherto all attempts to trace the origin of the reputed Hermetic writings have failed, and it has been assumed that the great "Hermes" was a mythological personage invented by the earlier alchemists to credit the acquired knowledge with the authority of antiquity. The manuscript when thoroughly deciphered may throw some light on this doubtful point, but even if it fails to do so, the fact that a fragment of the lost learning of the Egyptians has been recovered is a matter of scientific interest. The manuscript was discovered among the bones of a mummy some years ago by an Arab, and on his death it was offered to Dr. Ebers, who eventually purchased it at a considerable price. It consists of a single sheet of papyrus,

about sixty feet in length, and the characters are in red and black ink. Judging from the characters, the date of the manuscript may be placed about 1500 B.C., making it 3300 years old; and, if written in the earlier part of the century, it would have been contemporaneous with the period of Moses's residence at the court of Pharaoh. Only a portion of the document has at present been translated by Ebers, including some of the headings of the various chapters, such as "the secret book of the physicians," "the science of the beating of the heart," "the knowledge of the heart as taught by the priest-physician Nebseeht," "medicines for alleviating accumulation of urine and of the abdomen." There is every reason to suppose that the Egyptians attained a high degree of scientific knowledge at a very early period of their history. As Boerhaave aptly remarks, the fact that Moses knew how to reduce gold to powder, so as to render it miscible with water, and by this means potable, shows he had acquired a knowledge of chemistry only to be attained by the highest masters in the art. Indeed, Egypt seems to have been the birth-place of chemistry; for, according to Plutarch (*Is et Osir*), in the sacred language of the priests the country was called *Xnua*, which means, according to Bochart, hidden or secret knowledge. At the present day it is still called, we believe, by the Copts, the land of Kemi. Lindas has suggested that a knowledge of this art was introduced into Europe by the Argonauts, who sailed to Colchis to carry off the Golden Fleece. The Colchians, according to Herodotus, were an Egyptian colony, and Lindas supposes the Golden Fleece to have been a book written on sheep-skin, teaching the method of making gold by the chemical art. The date of the Argonautic expedition was, according to most chronographers, 1250 B.C., or 300 years later than the supposed date of Ebers' manuscript. It is to be hoped that future researches may bring to light further evidence of the scientific history of the past, and so enable us to estimate the degree of civilisation and scientific attainment reached by the early races of mankind.

### SALICYLATE OF SODA.

FURTHER observations on this salt as an antifebrile remedy have been published by a physician to the Berlin Metropolitan Hospital. Dr. Riess has used it with more than 400 patients, and speaks very highly of it as reducing abnormal temperatures with great certainty in doses of 5 grammes, and in children of six to twelve years in doses of 2.5 grammes of the acid. Twenty-three experiments on seven healthy persons showed constant reductions of temperature of 0.9° centigrade on an average within four to six hours. After doses of 5 grammes repeated over several days, the abnormal temperature generally lasted through the whole intervals. In contradiction to others, Dr. Riess did not observe any influence on the pulse. Even in 260 cases of typhoid fever, in which the decrease of temperature was most marked, more so than in the healthy subject, no important effect on the pulse was noted. Frequently, however, profuse perspiration followed in one or two hours, often a quarter or half an hour after the full dose, coinciding generally, but not always, with a rapid decrease of the body heat. Cold baths (15 to 20° centigrade) strengthened the effect of a single dose



In the same way as if repeated doses had been given. The antipyretic effect of the drug appeared to be in inverse proportion to the fatality of the cases; and though the mortality was 63 in 260, or 24.2 per cent., Dr. Riess contends that the convalescent patients had derived marked and early improvement from the effected decrease of temperature. Quick and important reductions were also obtained in cases of pneumonia (sometimes from 40 to 35° centigrade and less), in acute rheumatism, erysipelas, and thirty-two cases of phthisis. In two doses of ague, one or two doses of salicylate of soda mastered the disease quickly; in two others, three or four doses were required; but in five others the attacks could be checked only by quinine. The two following forms were made use of: Salicylic acid, 5 grammes; phosphate of soda, 10 grammes; distilled water, 50 grammes;—or salicylic acid, 5 grammes; carbonate of soda, 5 grammes; distilled water, 50 grammes. Generally unpleasant accompanying effects have not been observed; sometimes slight affection of the head, tinnitus aurium, and dimness of sight occur after the full dose; vomiting is very exceptional, and never caused the use of the drug to be discontinued. No burning sensation is felt, with the watery solution of the salt, in the mouth or pharynx.

#### FORCE AND WORK.

WORK without implies work within. No exercise of force can be made except by the generation and use of force of which no part enters into the external result. The use of muscles involves use of nerves. The external force, if exerted by a muscle, is only part of that which it produces. Now the proportion between these two in their several degrees is a subject of great practical importance, and some interesting facts have recently been published by Helmholtz. From these it is clear that the greater the external force exerted the greater is the proportion of the needful internal force—that is, great exertion is more wasteful than moderate exertion. Then force has to be evolved in proportion to the external work done, and therefore the greater is the wear and tear of the animal machine. The same increased proportion of non-productive work is seen when the external energy is below a moderate amount. It is found, for instance, that in walking, a speed of three miles an hour gives the most economical use of the forces. No doubt in these facts we have an index to much of the ill effects of the present high-pressure rate of work and life. The waste of force is out of proportion to the work done. More is effected in a given time, but the body feels it more, and its working period is proportionately shorter. These facts cannot be too often repeated or too constantly remembered by those who have the regulation of labor.

#### THE SKULL AS THE TYPE OF RACE.

PROF. VIRCHOW, whose work on the development of the base of the skull will be known to many of our readers, gave at the meetings of the Berlin Academy of Science, according to the monthly reports (Jan. 7th and March 15th), some interesting lectures on evolutionary defects of the

bones of the skull as a sign of some lower types of the human race. His observations referred to the processus frontalis, squamæ temporalis, and the catarrhine formation of the nasal bones, as positive symptoms of an animal-like, and especially of a monkeyish, type. The existence of the os incae, which is found in several South American aboriginal races, Virchow holds to be a simple arrest of development of the human type, and of a purely negative character, though it constitutes a very valuable sign for the determination of the ethnological characters, more so than is generally known. The os incae as a part of the os occipitis, which has not become waited by osseous tissue with the latter, forms the posterior covering of the cerebrum, while the cerebellum is covered by the lower part of the squama ossis occipitis. The latter serves as the place of insertion for muscles; the os incae, or os interparietale, is, as a rule, free of such insertions. In the aboriginals of Peru the os incae has been found to be always very large; in the Pampas Indians, however, it is often exceedingly diminutive. In the bare the muscle insertions ascend so high that the os interparietale appears as an oblong square between them. It is to be expected that Virchow will be able to extend his researches over the remains of all the South American aboriginal tribes, since the Emperor of Brazil sent him last summer, through his ambassador at Berlin, several boxes with bones from Indian graves, with a very complimentary letter, in which that enlightened Prince confesses his special interest in the matter.

#### ERGOTININE.

M. TANRET, a pharmacien of Troyes, in France, has presented to the Academy of Sciences of Paris a paper, wherein he states that he has succeeded in isolating the actual alkaloid of ergot of rye. For some time past ill-defined substances have been extracted from the ergot, one in particular by Bonjean, who gave it the name of ergotin. This being the case, the author of the paper, having actually obtained a stable and solid alkaloid, wishes to give it the name of ergotinine. The latter exists in the ergot in very small proportions, and it is easily altered in the open air, which circumstance renders its extraction difficult and delicate. The author describes the mode of preparation, which mainly consists in obtaining, by alcoholic distillation, a residue composed of a layer of fat, an extractive fluid, and some resin. From the first two substances, treated separately, the alkaloid is obtained by the use of ether, sulphuric acid, and chloroform on the one hand; and by distillation, chloroform, &c., on the other. The ergotinine has, of course, an alkaline reaction; it gives precipitates with the double iodide of mercury and potassium, with phospho-molybdic acid, tannin, chloride of platinum, &c. It is soluble in alcohol, chloroform, and ether, and becomes speedily changed when exposed to the air. Its principal reaction is to turn reddish-yellow, and then strong blue violet, with moderately strong sulphuric acid.

#### CHLORAL AS AN ANÆSTHETIC.

M. BOUCHUT stated at the Congress of Brussels

that he obtains anaesthesia in children with from forty-five to sixty grains of chloral at one dose. It is especially in very severe cases of chorea that most benefit has been obtained. The dose just mentioned was continued for a month or six weeks, so that the same little patient absorbed during that time no less than seven or eight ounces of chloral. When from forty-five to sixty grains are given at one dose, the child soon goes to sleep, and anaesthesia is complete in about one hour. If then an abscess is to be opened, the incision is made, the child being asleep. The latter may just sigh or groan, but falls asleep again; and when it awakes, three or four hours afterwards there is no knowledge of what has been done. When teeth are to be extracted, they manage in this way: At eight o'clock A.M. the nurse gives forty-five or sixty grains, according to age, at one dose, and the child falls asleep in twenty minutes. At nine o'clock the dentist comes, and extracts the carious tooth; or even two may be removed. The child groans and moves about without waking, and soon becomes again motionless. After about four hours the child awakes, and knows nothing of the operation. With children, then, chloral seems an excellent anaesthetic in the doses mentioned above; but it should be noted that no such result can be obtained with adults.

#### THE MUCOUS MEMBRANE OF THE UTERUS.

IN Stricker's *Medizinische Jahrbücher* for 1873 there appeared a paper on the Mucous Membrane of the Uterus by Drs. Kunchat and Engelmann. Dr. Engelmann, differing from some of the opinions expressed in that paper, especially those regarding the relation in time between ovulation and menstruation, has republished the paper with some additions and alterations in the "American Journal of Obstetrics." In its present form the paper treats of the mucous membrane of the uterus before puberty; its fully developed but quiescent state; its state during menstruation; of the decidua vera and reflexa during the first, second, third and fourth, and fourth to the ninth months of pregnancy; the development and structure of the placenta; retrograde metamorphosis of the membranes; the expulsion of the decidua and the regeneration of the mucous membrane after parturition.

## News Items, Medical Facts, &c.

**THE ANTIDOTES OF STRYCHNINE.**—At a meeting of the Society of Therapeutics of Paris, M. Constantine Paul said that the treatment of poisoning by strychnine should fulfil three indications: 1. Cause the patient to reject all the poison if possible, or at least whatever has not yet been absorbed. 2. Administer harmless substances which may render the poison inert—viz., in most cases, insoluble. 3. Treat the symptoms of poisoning. These three indications are carried out by evacuants, antidotes, and antagonists. Among the evacuants the author dwelt especially on apomorphine as likely to give good results. As to antidotes, they are principally iodine and tannin. M. Bouchardat, in respect of iodine, has given the following formula:—Iodine, ten grains; distilled water, about one ounce and a half; iodide of

potassium, about twenty grains for solution. It requires about one drachm of this solution to precipitate one grain of strychnine. This precipitate is, however, not harmless, and should be as soon as possible evacuated.

**EXPERIMENT ON A MAN RECENTLY HANGED.**—Several Philadelphia physicians obtained permission to perform experiments on a subject of this kind. Half an hour after death the laryngeal nerve was laid bare, as the problem consisted in learning whether, in paralysis of the larynx on one side, the nerve of the same side or of the other is affected, thus determining whether there is an interlacement of nerves. Dr. Keene, Professor of Physiology and Anatomy, was entrusted with the task of carrying out the experiment. The corpse was seated in a chair in the position of a patient whose throat is to be examined. An electric current was applied to the nerve, and an assistant held a mirror in the man's mouth, so as to ascertain which side of the larynx would contract. The experiment was decisive, and it was found that irritation of the right nerve caused contraction of the right side of the larynx.

**THE ALKALOID OF JABORANDI (HYDROCHLORATE OF PILOCARPINE).**—Experiments have been made in the Paris hospitals with this alkaloid, discovered by M. Ernest Hardy, and the process of extraction improved by M. Duquesnel. The principle of jaborandi may be given in doses of from three-quarters of a grain to two grains. A little more than one grain has been found sufficient by Dr. Pierre Dumas, who has made this alkaloid the subject of a thesis. The former seems to have an action almost analogous to that of the jaborandi-leaf; but the diaphoresis is less complete than the salivation, which latter is considerable, and connected with vomiting. This alkaloid has been used in cases where jaborandi is generally prescribed, and with the like effects. The urine does not seem much modified by the use of the alkaloid, but the proportion of its acid is diminished.

**PROF. DITTEL'S OPINION OF OBSTINATE STRICTURE.**—At a meeting of the Medical Society of Vienna on Nov. 5th, 1875, Prof. Dittel exhibited a patient on whom he had performed hypogastric tapping for a retention which had lasted six days (?). The professor had an apparatus constructed for this patient, very similar to that we use in this country. Dr. Dittel (in the *Allg. Wien. Med. Zeitung*) broadly expresses the opinion that when patients are suffering from catarrh of the bladder and enlarged prostate, they would do well to have their bladder punctured at the hypogastrium; and, in order to live long, to wear an apparatus for life, which allows the urine to be received in a receptacle placed under the clothes. This is rather a severe measure for a remediable complaint.

**TREATMENT OF TAPEWORM BY COPAIBA.**—At a late meeting of the Pathological Society of New York, Dr. Caro presented a specimen of tapeworm which had been expelled by a patient under the influence apparently of balsam copaiba, prescribed for another complaint. The patient in question had suffered from symptoms of tapeworm for some years, and had tried the usual remedies for their relief. Balsam copaiba was prescribed in large (half-ounce) doses; but one dose only was taken, which had the effect of acting freely on the bowels and expelling the worm.

**PAINLESS OPENING OF ABSCESSES.**—Dr. Bergonzini uses a solution of two parts of carbolic acid with one part of glycerine, and leaves the mixture in contact with the skin for three or five minutes. Redness or swelling never occurs, except the skin had been previously inflamed, or the liquid allowed to remain on too long. This anæsthetic agent might, according to the author, be used in autoplasmic operations, and he intends to try it in neuralgia where the seat of the pain is very superficial.

PRINTED AND PUBLISHED BY

WM. C. HERALD, No. 52 JOHN ST., NEW YORK.

# THE LANCET.

A Journal of British and Foreign Medicine, Physiology, Surgery, Chemistry, Criticism, Literature, and News.

JAMES G. WAKLEY, M.D., M.R.C.S., EDITOR.

PUBLISHED MONTHLY.

No. 4.

NEW YORK, APRIL, 1876.

## A Lecture

ON

### THE APPEARANCE OF PARALYSIS ON THE SIDE OF A LESION IN THE BRAIN.

By C. E. BROWN-SEQUARD,

M.D., F.R.S., F.R.C.P., Lond., etc.

GENTLEMEN,—Since the time of Mistichelli's discovery (in 1709) of the decussation of the anterior pyramids of the medulla oblongata, it has been universally admitted that one lateral half of the brain is the centre, or contains the centres, for the voluntary movements in the half of the body on the opposite side. Very strong—I may say decisive—arguments can be arrayed against this theory. On the one hand, either the anterior, the middle, or the posterior lobes of the brain, or a great part, or very nearly the whole of one hemisphere, or also a very great part of a lateral half of the pons Varolii or of the medulla oblongata, can be destroyed without paralysis; while, on the other hand, a paralysis may appear in one limb, or in both upper or both lower limbs, when the lesion is only in one lateral half of the brain. In other cases, and this is the principal object of this lecture, a paralysis may appear in one or in both limbs on the side of the lesion of the brain. If the universally admitted theory were true, most, or at least many, of the above-mentioned facts could not have existed; and if the new views first originated by Fritsch and Hitzig were true—if, in other words, special centres existed, one for the movements of the arm, one for those of the leg, many of the above-mentioned facts could also not have existed.

What I have just said of centres can be said of conductors also. If the conductors for the voluntary movements of the limbs on one side passed through the other side of the crura cerebri, the pons Varolii, and the medulla oblongata, a deep alteration, or a destruction, of a great part of one half of these organs would *always* be followed by a paralysis of the limbs on the other side. It is far from being *always* so.

The same thing may be said of the face and the tongue. A lesion in one half of the brain above the pons Varolii can produce a paralysis of the face or tongue, either in the corresponding or in the opposite side, and there is no relation between the intensity and extent of the facial or lingual paralysis, and the degree, the seat, or the extent of the disease.

On the one hand, therefore, there is not *always* what we should find were the universally received theory quite true; and, on the other hand, there are a great many facts in absolute opposition to the theory, as regards not only the movements of the limbs, but also those of the face and the tongue.

That this theory must be rejected is not, however, the only necessary conclusion from the facts, the existence of which I assert; another conclusion also issues forcibly from these facts. It is that one half of the brain is sufficient for the movements of the two sides of the body. It is not without the greatest reluctance that I have come to admit the correctness of this last view—reluctance assuredly well grounded in a practitioner seeing every day cases of paralysis occurring in the limbs, the face, or the tongue on the side opposite to that of the lesion in the brain. I need not say that I felt at once that to put down the old theory and to replace it by mine, it was not sufficient to have facts against the universally admitted doctrine; it was essential also to explain how paralysis can appear indifferently in one or in the other half of the body from a lesion in the same part of the brain.\*

In the actual state of science the cases of paralysis on the side of a lesion of the brain are looked upon with very dubious eyes. Dr. James Copland† denies almost absolutely that there are

\* I have tried to show elsewhere that paralysis in brain disease—as well as aphasia, anaesthesia, and in many cases also amaurosis—is the result of an inhibitory influence exerted on nerve-cells endowed with the function then lost—by an irritation starting from the part diseased or its neighborhood. The mechanism of production of the cessation of activity of nerve-cells at a distance from the place where is a lesion in the brain, I consider to be the same as in cases in which paralysis, anaesthesia, aphasia, amaurosis, deafness, &c., are caused and maintained by an irritation of nerves by worms in the bowels.

† A Dictionary of Practical Medicine, 1858, vol. iii., part i., p. 35. The arguments employed by Copland had already been put forward in one of the papers published by the old French Académie de Chirurgie as having deserved a prize in 1769. See *Prix de l'Acad. de Chir.*, nouv. édit.: Paris, 1819, vol. iv., p. 372; paper of Sabourant.

such cases. He states that the lesion found may have existed without producing paralysis, and that the paralysis that was observed may have had its cause in a lesion in the opposite side of the brain, not found after death. I do not doubt the possibility, even the probability, that it was so in some cases, but I will prove that, at least sometimes, the brain-lesion found on the side of a paralysis was the real cause of that loss of voluntary movement.

Before examining clinical facts, I will say that experiments on animals have given me this unforeseen result, that *a paralysis on the side injured always follows certain injuries of the surface of the brain*. The lesion which has the greatest power to produce this direct paralysis consists in a burn of a part of the surface of one hemisphere of the brain. The anterior, the middle, and the posterior lobes possess the power of generating that paralysis, but the two last parts more than the first. The deep-seated parts of the brain—i.e., the walls of the lateral ventricles, the corpus striatum, the optic thalamus—have also that power. The paralysis so produced is very slight, and it is variable as regards its seat: it usually exists in one of the limbs on the side of the lesion, sometimes in both; it also appears sometimes in the abdomen, the thorax, the face, the neck, the bladder.\* If the burn of the surface of the brain is deep, and very extensive, it produces sometimes a considerable paralysis in the four limbs, more intense in the two abdominal limbs, or in the two thoracic limbs, and greater, in those instances, in the limbs on the opposite side than in those on the side of the brain-lesion.†

The irritation due to a burn of the surface of the brain in rabbits, guinea-pigs, cats, and dogs, is not the only cause able to produce a paralysis on the side of a brain-lesion. Long ago Méhée de la Touche‡ found that a transverse section of certain parts of a lateral half of the brain or of the cerebellum in dogs is sometimes followed by a paralysis on the same side. I have seen the same thing, but very rarely, and the paralysis has been less than that which was seen by the surgeon just named.

If a paralysis appears in dogs and other animals on the side of a lesion of the brain, we certainly can look upon the same thing as possible in man; nay, there is a probability that it sometimes exists. This being stated, let us see what are the facts observed in man in which a paralysis has, or seems to have, existed on the side of the brain-lesion. I may startle many of my hearers in stating that I have collected *more than two hundred* of such cases. Burdach,§ out of 258 cases of paralysis in one half of the body, states that there were 15 on the side and 248 on the opposite side of a lesion in

the brain. W. Nasse,\* besides the 15 cases of Burdach, knew of 26 cases of paralysis on the injured side in the brain. In two good papers on the subject by Bayle† and Dechambre,‡ not more than 10 or 12 cases are pointed out. The 200 I have collected do not include those of Nasse's list (at least most of them), as I have not been able to procure the paper of that learned physician. But it is not the number of such cases that can alone carry conviction. The features of certain cases, or some peculiarity attached to them, will do much more to prove that the paralysis was really due to a lesion on the side of its appearance. The demonstration is, I believe, fully given by the following facts and arguments:—

1st. In a case in which a small bullet (a pistol shot) passed through the whole *right* side of the brain from back to front in the upper part, and at a distance of an inch from the middle line in the occipital bone, and one-third of an inch in the frontal bone, there was at once a paralysis on the same side (the *right*). Eight months after the paralysis was not quite cured. The case has been reported with great care by two Belgian physicians, Drs. Liévens and Demoor.§ It is impossible to admit that there was anything here but a lesion of the three lobes of the right side of the brain in parts where there is no large bloodvessel and above the lateral ventricle, so that no great effusion of blood can have taken place, and the effused blood cannot have passed from one ventricle into the other.

In a case in which a large mass of medullary cancer involving the *left* parietal bone had made its way outwardly, a pressure upon the tumour "caused temporary loss of power of motion in the *left* arm—that is, the arm of the affected side."

Mr. George W. Callender,|| who published this case, has supposed that in cases of paralysis on the side of a lesion in the brain there was a pressure exerted on the opposite side, the paralysis resulting from this pressure. In this case it is clear that a pressure on the tumour, if able at all to act on the right side of the brain, must necessarily have spent almost all its force on the left side, so that the temporary paralysis was evidently due to a lesion on the same side as that where it occurred.

In a very interesting case, published by Scholz, of Bremen,¶ a patient was attacked with aphasia, drooping of the *left* upper eyelid, and *left* hemiplegia, and was cured after the issuing of a good deal of pus from inside the cranium, through an opening, on the *left* side of the head at nine centimeters below the sagittal suture and on the coronal suture. An effort has been made to explain this case in admitting that the pressure exerted by the intracranial abscess had produced oedema and anæmia in the opposite side of the brain. It seems wonderful to me that such an idea can have, even for a moment, come to the mind of a surgeon of merit! Is it necessary to show that if the abscess was located near the place of exit of pus it is the left half of the brain alone, or nearly so, which bore the pressure, and that if oedema and anæmia resulted from that pressure, it was in the left half of the brain that they occurred?

\* In the November number of the Archives de Physiologie Norm. et Pathol. I have described as a constant effect of an irritation of the surface of the brain on one side, by a heated iron (the actual cautery), a paralysis of the cervical sympathetic nerve on the same side. The various kinds of paralysis in limbs, the thorax, &c., I intend to describe in the January number of that same periodical.

† It was in making experiments on the so-called psychomotor centres that I found the facts briefly mentioned in the text, concerning the effects of burning the surface of the brain. Knowing how powerful an irritant is heat, I thought that if those parts of the brain were what they are supposed to be, a movement would be produced in the limbs on the opposite side at the time of the application of the white-hot iron on these so-called centres; *no trace of movement appeared in any of my numerous experiments.*

‡ Traité des Lésions de la Tête par Contre-coup; nouv. ed.; Paris, 1874; pp. 7, 48, 52, 78, 92, 102, 162, and 259.

§ Vom Haufe und Leben des Gehirns, Bd. iii.; Leipzig, 1826; p. 370.

\* Zeitschrift für Psychiatrie, 1849.

† Revue Médicale, Janvier, 1824.

‡ Bulletin Clinique; Paris, 1835, vol. i., p. 111.

§ Gazette Médicale de Paris, 1844, p. 595.

|| St. Bartholomew's Hospital Reports, vol. iii., 1867, case xiii., p. 424-5.

¶ Revue des Sciences Médicales; Paris, 1873; vol. i., p. 692.

In another case it was clear also that the paralysis originated from a lesion on the corresponding side of the brain, as it came in the *right* limbs after a blow on the forehead and the temple on the *right* side; and the autopsy showed that the *right* parietal bone was perforated, and there was a large abscess over the *right* hemisphere.\*

In all the above cases the knowledge during life of a lesion on the side of the paralysis existed, and the connexion between the lesion and the paralysis was so obvious that it seems to me impossible that anyone giving time to the examination of these cases can suppose that an *unseen lesion* in the hemisphere of the brain on the opposite side to that of the paralysis was the real cause of this loss of movement.

Among the cases I could mention, having the same meaning as the four I have already related, there are three which I ought to give in addition to those four.

Dr. W. Swayne Little,† according to Gintrac,‡ has reported the case of a patient whose *left* side became paralysed after having had the *left* anterior lobe of his brain pierced by an iron spit.

Abercrombie§ gives a case of Hill,|| in which, after two months, during which there had been vomiting, headache, and numbness in the *left* hand, the whole *left* side became paralytic. After another month a small tumour appeared by the side of the bregma, which discharged matter, with some relief. Seven months later Mr. Hill found an opening in the *left* parietal bone, and, having applied the trephine there, he discovered an abscess, which discharged four ounces of matter. There was much relief after that discharge, but protrusion of the brain took place, and the patient died. The brain was found destroyed by suppuration two inches around the opening of the skull. In this case it is clear that the paralysis depended on the abscess, as it increased with it, and it diminished twice after the issue of matter.

J. Lafargue¶ gives a case of fracture of the *left* parietal bone, followed by *left* hemiplegia. Near the fracture the cerebral substance was found reduced to a brown-greyish pulp (*detritus*); this color, becoming bluish, extended to the centrum ovale. The right hemisphere was perfectly normal. There can be very little if any doubt that in this case the cause of the paralysis of the left side of the body was in the left half of the brain.

2nd. The second reason I will give to prove that a paralysis may be caused by a lesion in the same side of the brain is drawn from cases in which there were symptoms of hæmorrhage in the brain at the time that a paralysis appeared, and in which no hæmorrhage in that organ was found after death except on the side of the paralysis.

Diday,\*\* a very accurate observer, relates that a woman lost consciousness suddenly and completely, and when she recovered her senses her right limbs were paralysed. For five years she remained incompletely paralysed (of the *right* limbs and *right* side of the face). She died of

heart disease, and the autopsy showed no disease in any part of the brain, except in the *right* side. An old cyst replaced the right corpus striatum, and the neighboring white radiations. In the *right* posterior lobe there was a very small yellow cicatrix.

Dégrandes,\* quoted by Gintrac,† gives the case of a girl who was attacked with vomiting, coma, paralysis of the *right* limbs and convulsions, then spasmodic contraction of the same limbs. In the centre of the *right* posterior lobe, a small clot was found surrounded by a yellow, soft pulp, with red punctuations.

Mr. G. W. Callender‡ gives a case of sudden paralysis of the *right* side, followed by death in nine hours. A recent clot, the size of a walnut, was found in the *right* hemisphere. Thence the blood, passing through the corpus striatum, had entered the various ventricles.

A very interesting case, with considerable details, is given by Hillairet,§ a distinguished physician of Paris. The patient had several attacks of hæmorrhage of the brain, all in the right half; the *right* posterior lobe was almost destroyed, and the *right* optic thalamus was notably atrophied. The paralysis was on the *right* side.

In a well-recorded case, Gintrac|| states that a patient became paralysed of the whole *left* side, face included, after an attack of apoplexy. There was closure of the *left* eye, and diminution of feeling in the *left* arm. Between the corpus striatum and the optic thalamus on the *left* side, and the cerebral substance on the external part of the organ, there was a cavity three inches in length, one inch in height, and as much in width, containing a clot of blood.

There are on record a number of other cases of apoplexy with hemiplegia on the side of the cerebral hæmorrhage. I will only name the authors who have published such cases:—Morgagni,¶ Brunner,\*\* Lermnier,†† Dr. R. Boyd,‡‡ Rostan,§§ Albi.||||

It is clear that when we find hemiplegia appearing together with apoplectic symptoms, we must admit that the only lesion found, and consisting in evidences of fresh or old laceration of brain-tissue by effused blood, is the cause of the paralysis; and if, as in the above cases, the loss of motor power appears on the side of the brain lesion, it is evident that in those cases the explanation that that kind of hemiplegia depends on an *unseen* lesion in the opposite side of the brain must be rejected.

3rd. In a number of cases of paralysis on the side of the only lesion found in the brain there was aphasia coexisting with left hemiplegia, the left side of the brain being the seat of the only organic alteration found after death. Such is what was found in the following cases. One of Professor J. Syme,¶¶ in which there was fracture

\* Journ. de Med. de Bordeaux, 1841, p. 164.

† Loc. cit., vol. vii., p. 104.

‡ St. Barth. Hosp. Reports, iii., 1867, p. 435.

§ Memoires de la Soc. de Biologie, 1858, p. 129.

|| Loc. cit., vol. vii., p. 226.

¶ Rech. Anat. sur le Siege et les Causes des Maladies, Paris, 1820, vol. i., p. 145.

\*\* Quoted in Traite des Maladies du Cerveau, par A. L. J. Bayle, Paris, 1826, p. 319.

†† Annuaire Medico-Chirurgical, Paris, 1819, p. 223.

‡‡ Medical and Chirurgial Transactions, London, 1856, vol. xxxix., p. 62.

§§ Rech. sur le Ramoll. du Cerveau, 2nd edit., Paris, 1823, p. 97.

|||| Bull. de la Soc. Anat., 1851, p. 252.

¶¶ Edin. Med. Journal, Oct. 1833. Translated in Journal des Connaissances Medico-Chirurg., Paris, 1833, vol. i., p. 216.

\* Lepine, of Chalons, in Annales Medico-Psycholog., 1844; vol. iii., p. 129.

† Dublin Quart. Journ. of the Med. Sciences, Aug. 1851, pp. 226.

‡ Cours de Theorique et Clin. de Pathol. Interne. Paris, 1868, vol. vi., p. 326.

§ Pathol. and Practical Researches on Diseases of the Brain. 4th edit., Edinb., 1845, p. 190.

|| Cases in Surgery, p. 130.

¶ Gaz. de Med. de Paris, 1836, p. 616.

\*\* Bulletins de la Soc. Anat. de Paris, 1836, xi., p. 77.

of the cranium, with very considerable serous effusion pressing over the *left* middle lobe, which was much altered; this lesion producing aphasia and paralysis of the *left* side. Another of Cruveilhier,\* in which a great part of the *left* anterior lobe was hardened and red, paralysis of the *left* side and loss of speech being the symptoms. A third of Bayle,† in which there was disease of the meninges and the convolutions and white substance of the anterior lobe on the *left* side, with aphasia and paralysis of the *left* limbs.

Unless we admit either that the aphasia alone depended on the lesion found in the *left* side of the brain and the paralysis on a supposed but unseen lesion of the *right* side of the brain, or that both the aphasia and the paralysis did not depend on the only organic alteration found in the *left* half of the brain, but on another lesion not found, but supposed to exist in the *right* half—two equally improbable explanations,—we must accept as correct that paralysis in those cases was caused by a lesion in the corresponding side of the brain.

4th. The extent of the lesion is also a strong argument in favor of the view that in some cases of paralysis on the side of the organic alteration in the brain the cause of this loss of movement was that alteration itself, and not a supposed but unseen one in the other half of the brain. Among cases of that kind I will briefly mention some, two of which—those of Dr. Henry Day, of Stafford, and Dr. Dechambre, of Paris—deserve special attention, on account of the great care with which the autopsy was conducted.

P. P. Brocq‡ relates that in the case of a woman who had lost the power of motion and feeling in the *left* limbs, remaining intelligent, the *left* hemisphere was reduced to a pulp (*bouillie*).

Freschi§ states that a woman who had once had a temporary paralysis of the *right* arm one day screamed out that her *right* arm and leg were dying away, after which she lost consciousness, and soon died. The *left* hemisphere was found perfectly healthy; the *right* was transformed into an enormous cavity containing a blackish clot and fluid blood.

Mr. G. W. Callender|| gives this case:—A male, after having been attacked with epilepsy, and then cured for five years, had a return of the fits, with *left*-sided paralysis. From front to back the entire *left* hemisphere above the level of the corpus callosum was one large abscess. A mere shell of soft brain-tissue separated it from the ventricle and from the surface.

Ch. Curtius¶ speaks of a case of apoplexy, with paralysis of the *right* side, in which the whole *right* hemisphere was converted into a mucous substance, which came out like a thread when a knife was lifted up out of it.

Rostan,\*\* in a woman who had been suddenly attacked with a complete hemiplegia of the whole *left* side, found almost the whole *left* hemisphere in a state of pulaceous softening.

Dechambre,†† in a good paper on the subject of paralysis on the side of the lesion in the brain,

gives all the details of a case in which a sudden paralysis, which soon became complete, with drooping of the upper eyelid, occurred in the *right* side. The autopsy showed no lesion in the *left* side of the brain, but there was considerable alteration of the *right* hemisphere. Many parts of the middle lobe were reduced to a reddish pulp, the corpus striatum was destroyed, and the softening occupied the centrum ovale and also parts below the lateral ventricle.

In the presence of such facts it seems to me almost impossible to maintain that the great lesion found at the autopsy of those seven patients had not produced paralysis, and that the hemiplegia existing depended on an alteration not detected in the side of the brain which was declared healthy by the able men who made the autopsy.

5th. The location of a lesion in the brain may give also a strong argument in favor of the view that a paralysis can be produced by a lesion in the corresponding side of the brain. If we find, for instance, that simultaneously with a paralysis in one half of the body, symptoms appear which point to a certain part of the base of the brain as the seat of the disease, and if the autopsy confirms this diagnosis, it is almost certain that the paralysis was caused by the lesion found. I was able in two cases to diagnose the seat of the disease in cases of paralysis on the side of the lesion, and the autopsy showed that I was right.

In a very large number of cases paralysis has appeared on the side of the encephalic lesion, when it existed in or on the pons Varolii, the cerebellum, the crus cerebelli, the medulla oblongata, or other parts of the base of the brain. Indeed, in cases of disease of the petrous bone or of the surface of the encephalon near that bone, paralysis, if it occurs at all, will appear as frequently on the side of the lesion as on the opposite side. I will by and by discuss the question whether there are nerve-fibres that have not yet made their decussation. All I wish now to impress on your mind is that those parts of the cerebro-spinal centres are very peculiar. They are so not only because they often give rise to paralysis on the side of the lesion, but also because they can be more injured than any part of the spinal cord—of which most of them are chiefly a continuation—without giving rise to symptoms, and because when injured in one of their halves there is either no paralysis or a paralysis on the opposite or on the same side, and in this variety also they greatly differ from the spinal cord.

Among the cases of paralysis on the side of the lesion, with disease of the base of the brain, there is one which must be singled out, as it shows more than any other that with the destruction of all (or very nearly all) the motor conductors of one side—those that some suppose not to have yet made their decussation, as well as those the crossing of which with similar ones of the other side is already made—paralysis can appear in the limbs and face only on one side, and that side the one in which the lesion exists. This case was long ago published by Mr. Stanley.\* The *left* side of the face of the patient was attacked with paralysis of motion and sensation; the *left* limbs were paralysed of motion. The autopsy showed that a tumour occupied the whole of the *left* side of the pons Varolii, extending into the *left* crus cerebelli.

\* Dictionnaire de Medecine et de Chirurgie Prat., Paris, vol. iii., 1829, p. 269.

† Loco cit., p. 312.

‡ Appreciation des Progres de la Physiol. These de Concours. Strasbourg, 1837, p. 44.

§ Gazette Med. de Paris, 1844, p. 58.

|| Loc. cit., vol. iii., 1867, p. 440, case xlviii.

¶ Quoted by Morgagni, loc. cit., 1821, vol. ii., p. 45, and 1824, vol. ix., p. 232.

\*\* Loc. cit., p. 67.

†† Bulletin Clinique, Paris, 1835, vol. i., p. 113.

\* London Medical Gazette, 1828, vol. i., p. 531.

If we now survey the whole field of the cases I have briefly mentioned or alluded to, it is clear that the following conclusion comes out forcibly from these facts—that there cannot be a doubt that there are cases in which hemiplegia has been caused by a lesion in the corresponding half of the brain. But is there no explanation of these cases in harmony with the universally admitted theory that one-half of the brain is the centre, or contains the centres, for the voluntary movements of the limbs on the opposite side? This is the question I will now examine.

A very natural explanation of direct paralysis has been given by Mr. John Hilton, Longet, and other physiologists. It consists in the supposition that in those cases there was no decussation of the anterior pyramids. No doubt this explanation would be decisive if it were shown that this decussation had no existence in such cases, and also that in the medulla oblongata the anterior pyramids are really—as is believed by almost all physiologists—the only, or at least the principal, channels of communication between the will and the muscles of the limbs. But, as I will show, the decussation of those anterior parts of the medulla oblongata, when carefully looked for, has always been found by anatomists of our times, not in cases of direct paralysis (in which, unfortunately, no examination seems ever to have been made), but in thousands of cases of healthy or diseased brain; and, as I also will show, the anterior pyramids, if they contain some nerve-fibres endowed with the function attributed to them, are very far from being the principal channels between the motor centres and the muscles of the limbs.

Is the decussation of the anterior pyramids absolutely constant? The statement made by Serres, that he and his pupils found the decussation in every examination of the brain made by them (and this was done in eleven hundred human bodies), is also what I have heard from all the anatomists whom I have questioned. It is also the result of my own researches and of those of my pupils, not on the human brain alone, but also on the brain of dogs, cats, rabbits, and other mammals. No living anatomist, so far as I know, has ever met with a case of absence of the decussation of the anterior pyramids, or at least of most of its usually decussating fibres. The recent researches of Flechsig\* show that the number of decussating fibres is variable, but not to a considerable extent, and the variations are too frequent to give ground to an explanation of facts so relatively rare as the cases of direct paralysis.

But it is useless to pursue the demonstration that anatomy gives no support to the supposition that direct paralysis is to be explained by an absence of decussation of the anterior pyramids, if it is shown that these parts of the medulla oblongata do not possess the function attributed to them, or, at least, are only partially endowed with it. Magendie† says that after having divided transversely in living animals one of the anterior pyramids, he found no paralysis either on the same or the opposite side, and that after the transversal section of both pyramids, in the middle of their length, there was no very evident trouble in the voluntary movements.

He adds, “I believe I have only observed some (*un peu de*) difficulty in the forward walking (*marche en avant*).” Moritz Schiff\* states also that after a transversal section of both anterior pyramids he found no evidence of either lasting or temporary paralysis. In 1851 Messrs. Vulpian and Philipeaux† performed on dogs an experiment which in more than one sense was an *experimentum crucis*; they divided the medulla oblongata longitudinally at the level of the crossing of the fibres of the anterior pyramids on the middle line. In two of their experiments they found that there was no complete paralysis. The animals stood for some time on their limbs, and one of them was even able to make several tottering steps. For those who know how much even a prick of the medulla oblongata is powerful in diminishing strength (as sometimes even a sudden cessation of life may be due to that cause), it will be evident that this experiment agrees with those of Magendie and Schiff in demonstrating that if the anterior pyramids have in some degree the motor function attributed to them, they are certainly not the only part, nor even the principal one, in the medulla oblongata endowed with that function.‡

For many years I held very different views, but recent experiments on dogs, rabbits, and guinea-pigs have led me to accept that conclusion. After having made the same operation that the two last physiologists have performed, or the transversal section of either one or both pyramids, I have often obtained very nearly the same results obtained by Magendie and Messrs. Vulpian and Philipeaux. Never, however, did I see, what Magendie and Schiff seem to have seen, that there is no trace of paralysis after a section of one or of both pyramids. Always, on the contrary, even when one pyramid only had been divided, I saw some trouble in the voluntary movements, but sometimes the weakness, which was always greater on the opposite side, was really very slight, and required care to be detected.

But there are clinical facts, which as they were observed in our species, are more conclusive than the results of vivisections. One of the most accurate observers of our time, Professor Vulpian, has published two such cases.§ In one of them the autopsy showed that the two anterior pyramids were very much atrophied, the right much more deeply than the left. There was also a slight loss of substance in the left crus cerebri, and a hemispherical cavity in the anterior part of the inferior surface of the pons Varolii, the cavity being half a centimetre in depth and diameter, and containing a serous fluid. A few days before death, the patient walked without dragging either of her lower limbs, and made use of her hands. In other words, there was no appearance of paralysis, although the crus cerebri and the pons Varolii, and the left anterior pyramid, were altered as I have

\* Lehrbuch der Physiol. des Menschen, Lehr. 1850, p. 306.

† See Prof. Vulpian's important work, *Leçons sur la Physiologie des Syst. Nerveux*, Paris, 1866, p. 492.

‡ In a good paper on the Medulla Oblongata John Reid says that it would be interesting to ascertain the functions of the decussating fibres of the pyramids. On irritating the upper part of the pyramidal bodies in two kittens with the point of a needle, he observed extensive muscular movements, but whether these belonged to the class of reflex movements, or resulted from the impression being conveyed directly to muscles, he could not determine. (See his *Physiological, Anatomical, and Pathological Researches*, Edinburgh, 1848, p. 313).

§ Loc. cit., pp. 493 and 494.

\* Centralblatt, 1874, No. 36, p. 561. Analysed in the *Revue des Sciences Médicales*, de G. Hayem, 1875, vol. v., p. 9.

† *Precis Elementaire de Physiologie*, 4ème edit., Paris, 1836, vol. i., p. 415.



said, while "the right anterior pyramid seemed completely atrophied."

In another patient who was attacked with paraplegia owing to disease of the dorsal region of the spinal cord, there was no trace of paralysis in the upper limbs, and the anterior pyramids were both considerably atrophied. "Almost all the nerve-fibres of these pyramids had disappeared, and the normal tissue had been replaced by sclerous tissue."

I could mention a number of other clinical observations having almost as much value, but a single well-observed case is quite sufficient, and I will not therefore add any other fact to the two decisive cases of Professor Vulpian.

The experimental, and still more perhaps the clinical, facts I have mentioned, clearly show that if the anterior pyramids contain some of the motor nerve-fibres through which the will acts on the muscles of the limbs, they certainly do not contain all or even most of the nerve-fibres endowed with that function. This being established, it is clear that we are not entitled to explain by a lack of decussation of the anterior pyramids any case of direct paralysis, but especially those cases in which the loss of voluntary movements was complete or considerable.

In addition to the arguments I have given to show that the appearance of paralysis on the side of a lesion in the brain cannot be explained by a lack of decussation of the anterior pyramids, I will say that in a great many cases in which I have produced in dogs, rabbits, and other animals, a paralysis on the side of an irritation of the surface of the brain by an application of heat, I have very carefully examined the medulla oblongata, and found there the normal condition of interpyramidal decussation.

But for those who believe that the *crossed* paralysis in cases of brain disease—i.e., the kind of paralysis which we meet every day—depends necessarily and entirely on a lesion of decussating conductors, or of centres from which start decussating conductors, it is evident that a decussation of the voluntary motor nerve-fibres must take place somewhere in the base of the brain, and for those who have such a view it is quite natural to suppose that in the exceptional cases in which a brain lesion produces a direct paralysis, there is no decussation.

If what I have said excludes sufficiently the anterior pyramids, what then is the place where the voluntary motor nerve-fibres decussate? J. Budge,\* Valentin,† Foville,‡ and others have supposed that this decussation takes place all along the base of the brain, and principally in the pons Varolii. It is easy to show that this proposition is contrary to facts.

If it were true that there is a decussation of voluntary motor conductors all along the base of the brain, beginning at the upper part of the crura cerebri, at the base of the tubercula quadrigemina, and ending at the lower part of the medulla oblongata, the *crossed paralysis* that we observe generally in cases of disease of one of the lateral halves of the medulla oblongata or of the lower part of the pons Varolii could not be—what it

often is—complete. Take, for instance, a case like that of Dr. Samuel Annan,\* in which there was a tumour occupying the right lateral half of the medulla oblongata and a small part of the right side of the pons near the medulla, producing *complete* paralysis of the left limbs and of the right side of the face. The paralysis in this case should have been incomplete, because, according to the theory, all the voluntary motor fibres decussating above the seat of the tumour must have escaped injury, so that some voluntary power should have remained in the left limbs.

In many other cases† of disease either at the place where it was in Annan's case, or in the pons Varolii alone, a complete crossed hemiplegia was observed, so that there is no question that with a normal state of either of the parts above the pons where a decussation is supposed to exist, and sometimes also of the upper part of the pons itself, there was a paralysis the completeness of which was in opposition to the supposition of such a decussation. Still more, supposing that in those cases, the disease occupies one lateral half of the lower part of the pons, or one half of the medulla oblongata, the decussation, if it exists, must necessarily bring into the part diseased nerve-fibres from the other side of the brain; so that according to this supposition of a decussation, many voluntary motor fibres coming from the right side of the brain—when, for instance, there is disease of the left side of the medulla oblongata or pons Varolii—would necessarily be paralysed, and as they go to the muscles of the left limbs there should be a direct paralysis (that is on the left side) together with the crossed paralysis existing in the right side. Such is not what we observe, at least in most cases.

Therefore, for these two decisive reasons—1st, that the crossed paralysis is often complete, while according to the theory it should not be so in these cases; 2nd, that there is no marked direct paralysis, such as should exist according to the theory,—we must reject the supposition that the voluntary motor nerve-fibres decussate above the lower part of the medulla oblongata.

And now, if it is certain, as I have, I think, positively proved, that at the lower part of the medulla oblongata, if there are nerve-fibres among those that decussate which are voluntary motor conductors, their number cannot be very large, it is clear that the explanation for crossed hemiplegia must be looked for in something else than the supposed passage of voluntary motor fibres from the brain on one side into the spinal cord on the other side. It is clear—to express this idea in other words—that a decussation of the voluntary motor conductors is not the organic condition allowing the production of the common crossed paralysis.

Decussation not being the organic condition of crossed paralysis, it is evident that its supposed absence cannot be the ground of an explanation of direct hemiplegia.‡

\* Untersuchungen über das Nervensystem. Erstes Heft. Frankfurt-am-Main, 1841. pp. 27, 28.

† Traité de Neurologie. Trad. Française. Paris, 1842. pp. 236, 246.

‡ Traité Complet de l'Anatomie du Système Nerveux. Paris, 1844. pp. 238, 326.

\* The American Journal of the Medical Sciences, vol. ii., July, 1841. p. 105.

† See for such cases a paper of mine in Archives de Physiologie Normale et Pathol., vol. i. 1868. pp. 718-24.

‡ Budge's view, that the nerves of the arms decussate in the pons and those of the legs in the medulla oblongata, are contrary to a great many facts. It is sufficient to say against that view, that if it were correct, a disease destroying a lateral half of the pons would produce paralysis of both arms and one leg. In most cases, instead of this peculiar paralytic manifestation, there was crossed hemiplegia; in one, direct hemiplegia; and sometimes there was paraplegia with paralysis of one arm.



After this argumentation and these conclusions, it would be almost useless to discuss at length the views that in all brains there are in each half two sets of voluntary motor nerve-fibres—one direct, another decussating; and that a direct or a crossed paralysis depends on the seat of the paralyzing lesion. There is no doubt that certain parts of the base of the brain which have been supposed to contain non-decussating motor fibres, owing to their relations with the anterior columns of the spinal cord, are more often than others the seat of the lesion in cases of direct paralysis, but the same parts are as often found diseased in cases of crossed paralysis.

Certainly a case like that of Dr. A. T. H. Waters, of Liverpool, in which there was a wound of the posterior and lateral parts of the right half of the medulla oblongata, with paralysis of the right half of the body and face, would easily be explained by the supposition that those parts of the medulla contain voluntary motor fibres that do not decussate; but what then of the case of Annan, already quoted, in which the same parts (with others) were destroyed, and in which there was only crossed hemiplegia? Still more what to do with a case like that of Dompeling,\* destroying not only the same parts that were lacerated in the case of the able Liverpool physician, but also most of the fibres of the anterior pyramid, and still producing hemiplegia on the corresponding side only?

It has been supposed by some physicians that direct paralysis has its cause in some influence exerted on the opposite side of the brain by the diseased part. My eminent friend Prof. Vulpian,† in a case of direct paralysis from disease of the cerebellum, found that there was more fluid in the lateral ventricle of the side opposite to that of the paralysis. He asks if that is not a cause that could explain the paralysis in that case and in others. Such a cause may have existed sometimes, and the paralysis may have been due to it, but in many cases of direct paralysis no fluid was found in the lateral ventricles; in many others there was as much in one as in the other; and in one, a case of Hahn,‡ there was more fluid in the lateral ventricle on the side of a tubercle in the brain which was also the side of the paralysis than there was in the other lateral ventricle. Besides, there are on record three cases of disease of a lateral ventricle with paralysis on the same side.

A state of anæmia or oedema of one side of the brain has also been supposed to explain direct paralysis, which, if this explanation were right, would become a crossed paralysis. This explanation, if it could at all be true for some cases, is certainly unacceptable for most cases. Take, for instance, a case like that of Luncau,§ in which there was a clot in the left vertebral artery, with paralysis on the side where circulation was altered in the medulla oblongata. In this remarkable case, the organic alteration was evidently limited to the side of the arterial obliteration, which was that of the paralysis. An almost similar case has been published by Dr. W. H. Dickinson.||

Direct, like crossed paralysis, may be due to the most various organic causes: a wound, a tumour, an abscess, softening (due to embolism or inflammation) atrophy, or hæmorrhage. Direct paralysis, like the other kind, may also be caused by disease almost anywhere in the brain: the meninges, the convolutions, the anterior, middle, or posterior lobes, the centrum ovale, the walls of the lateral ventricle, the crus cerebri, the crus cerebelli, the cerebellum, the pons Varolii and the medulla oblongata, and also the corpus striatum and the optic thalamus. Direct paralysis can also, like crossed paralysis, be complete or incomplete, strike only one limb or both, be accompanied by contracture or convulsions, anæsthesia or hyperæsthesia.

Many persons erroneously believe that in our century cases of direct paralysis have been less frequently observed than in the preceding centuries; and this supposition is allied with the other, that at least many of such cases are worthless because the authors who have published them were not good observers. Besides the names of able or eminent men I have given already, there are many others, so that there is no doubt as regards the exactitude of observation. It will be enough to point out at random among the writers, not yet named in this lecture, who have published cases of direct paralysis the following:—Dr. J. Hughlings Jackson, R. Bright, Mr. Campbell de Morgan, Cruveilhier, Prof. Horner, Dr. Peter Eade of Norwich, Jobert de Lamballe, Wenzel, Dr. Reynaud of Paris, Prof. Lebert, Gibert, Cazauvielh, Prof. Andral, Blandin.

Cases of direct paralysis are certainly not so very rare as is believed. I have seen five or six—two only, it is true, in which an autopsy has demonstrated the correctness of the diagnosis. Wedemeyer, Roestan, Mr. Callender, have each of them seen many cases. My friend Dr. J. Hughlings Jackson has seen at least two, and many other observers have also published two cases.\*

Reverting now to what I have said in the beginning of this lecture, I will repeat that it is not possible to look upon paralysis in cases of brain disease as being the effect of loss of function of the part diseased, and that we must admit that in those cases there is an irritation starting from the place we find diseased after death, and acting on more or less distant parts of the nervous centres, in such a way as to arrest their activity, and thereby cause the paralysis.

With this view, and only with it, we can explain that a lesion in one part of the cerebral lobes will produce or not a paralysis, that the paralysis will exist in the same or the opposite side, or in both sides (and there are many such cases in which a direct and a crossed hemiplegia simultaneously, or one after the other, will appear in consequence of a lesion in only one-half of the brain). With the view I have given, the immense differences that are found in the degree, the duration, as well as the seat of paralysis, can be explained, as we are to expect the greatest variety in effects of irritation, while this excessive variety is a death-blow to the admitted theory that paralysis in brain disease depends on loss of function of the part diseased.

\* I must say that some of the cases I have collected may be altogether insignificant, because the printer or the writer, instead of the word right, may have used the word left, and *vice versa*. I have tried to guard against this by inquiring, and well I did, as my eminent friend Dr. Charcot and Dr. S. Wilks have answered about cases of theirs, that such a fault had been committed. But I may not have inquired enough.

\* Dr. Waters's case was published in the *Medico-Chirurgical Transactions*, London, 1863, vol. xlv., p. 115. I have reprinted it with Dompeling's case in *Archives of Scientific and Practical Medicine*, New York, 1873, pp. 135-137.

† *Comptes Rendus de la Société de Biologie*, 1861, pp. 38-40. I will call attention to the interesting remarks made by Prof. Vulpian on the decussation of the voluntary motor fibres. (Foot-note, pp. 38-9.)

‡ *De la Meningite Tuberculeuse*, Paris, 1853, p. 37.

§ *Comptes Rendus de la Société de Biologie*, 1870, p. 132.

|| *St. George's Hospital Reports*, vol. i., 1866, p. 261.

These facts and reasonings, with many others mentioned in this lecture, as well as a great many not mentioned, lead to the following conclusions:—

1st. That it is wrong to conclude from the apparition of paralysis, when there is disease in the brain, that the loss of movements depends upon the loss of function of conductors or centres employed by the will in the production of movements.

2nd. That if there is any decussation of voluntary motor conductors anywhere in the base of the brain, it is not owing to the absence of such a decussation that direct paralysis sometimes appears.

3rd. That it is owing to an irritation that one-half of the brain is capable when diseased, of producing paralysis either in the corresponding half of the body or in the opposite one.

## Clinical Lecture

ON

## PLEURITIC EFFUSION.

*Delivered at the Liverpool Royal Infirmary.*

By A. T. H. WATERS, M.D., F.R.C.P.,

Physician to the Infirmary.

GENTLEMEN,—I wish to call your attention today to some cases of pleuritic effusion which have been in my wards, and to make them the subject of some remarks on the affection. I shall confine myself for the most part to those points which I consider of the greatest practical importance, and first I refer to the subject of diagnosis.

It may, perhaps, appear to you to be very easy to diagnose the existence of fluid in the pleural cavity—to differentiate between liquid and solid matter within the cavity of the chest; and yet it is in some cases by no means so. I have known physicians of great practical experience mistake a solid lung for pleuritic effusion, and pleuritic effusion for a solid lung, and I have not been myself altogether free from such errors. There is, indeed, no single sign which invariably exists by which pleuritic effusion can in all cases be certainly diagnosed, and it is undoubtedly true that the characteristics of its presence on which we mainly rely may and often do lead us into error.

Let me say a few words in reference to the evidence we derive of the existence of effusion from *percussion*. It is obvious that any solid or liquid in the chest will give rise to dulness on percussion; and it can only be by the character of the dulness, or its shifting nature, that we can say that it depends in any case on pleuritic effusion. Undoubtedly there is usually—indeed in the great majority of cases—a profound character about the dulness which can scarcely be mistaken; but there are exceptional cases of extreme dulness without any effusion. You may recollect the case of B—, in No. 10 ward, who came to us with a history of pleurisy, and in whom we found dulness of a very leaden character over the whole of the left side, extending up to the clavicle, and passing to the extreme right of the sternum. The breath-sounds were absent below, and only heard faintly at the

upper part of the chest; moreover there was absence of vocal vibration, and the heart-sounds were faint and best heard to the right of the sternum. The presumption that pleuritic effusion existed was very strong, and it was thought desirable to ascertain the fact, so that if fluid were present some of it might be drawn off, and thus the urgency of the symptoms be relieved. A fine canula was accordingly introduced, and the aspirator was used, with the result, however, of drawing off only a few drops of blood. Not satisfied with one exploration, I subsequently repunctured the chest at a different spot, but the result was the same. The progress of the case showed its nature: faint crepitation was heard after a time, and death revealed to us the actual condition of the lung. It was more or less solidified throughout, and universally adherent to the chest-walls; the pleuræ were greatly thickened; and there were strumous deposits in the anterior mediastinum. These deposits had caused the dulness, which extended to the right margin of the sternum, producing thus a sign which, taken with the other signs, I had never previously met with in any lung disease except pleuritic effusion and cancer.

Again, in reference to the shifting nature of the dulness, you must not, in diagnosing pleuritic effusion, depend too much on the fact, which I have often demonstrated in the wards, that the line of dulness varies according to the position of the patient. If the lung is perfectly free from adhesions, the fluid in the chest will gravitate to its lowest part, and the upper line of dulness will vary according as the patient is sitting or lying; but some of you will recollect the case of the woman in No. 15 ward in whom we had marked dulness, with absence of breath-sounds, in front of the left lung reaching to the level of the second rib, with resonance at the back extending even below the angle of the scapula, and from whom we drew off, at the time these signs were present, a large quantity of pus.

*Auscultation* often affords valuable aid in the diagnosis of pleuritic effusion. Speaking generally, the breath-sounds are usually either absent or faint over the seat of effusion, but they may be also absent over an intensely solidified lung, or over one which is less solidified but adherent by very dense pleuræ to the chest-walls, just as was the case in B—, to whom I have referred. Again, the breath-sounds may be very loud, simulating those of a solidified lung, when there is a large pleuritic effusion. There was a woman under the care of my colleague, Dr. Glynn, some time ago in whom loud bronchial breathing was heard, both over the front and back of the right lung, where there was marked dulness, and yet, as was subsequently proved, a very large quantity of fluid existed in the pleural cavity. In children, again, the phenomena of bronchial breathing and bronchophony are often present, although the effusion may be great, and I have met with other instances besides the one I have alluded to where loud breathing has been heard in adults. Moreover, you must not forget that in old-standing cases of effusion the sound lung takes on increased action, the breath-sounds become puerile, and may sometimes be heard on the opposite side of the chest.

But to take another sign to which great importance is very properly attached. In pleuritic effusion it is undoubtedly true that *vocal vibration* is generally absent; that when the hand is placed on

the chest whilst the patient speaks, no thrill is communicated to it; and yet I have sometimes felt a well-marked vibration over a chest from which I have immediately afterwards removed a large quantity of fluid. Some of you may recollect the case of A—, in No. 10 ward, who was the subject of empyema. In that case I pointed out to an assembled class that we had most of the signs of pleuritic effusion well marked—viz., leaden dulness, absence of breath-sounds, &c. The man had been previously tapped, and a considerable quantity of fluid had been withdrawn. We had watched the gradual reaccumulation of the fluid, and the time had come when I resolved to retap. Over the affected side—over the seat of leaden dulness, and where the breath-sounds could not be heard—there was distinct, well-marked vocal fremitus. An aspirator-tube was introduced, and we drew off ninety ounces of pus.

I removed, some time ago, two pints of serous fluid from the chest of a man in whom vocal vibration was distinctly perceptible, except at the extreme base of the lung—perceptible where there was marked dulness from the presence of fluid.

Again, there was the case of the woman McK—, in No. 15 ward, who was admitted with pleuritic effusion, and was tapped several times. Before the first tapping you may recollect that there was distinct vocal vibration at the lower and back part of the affected side of the chest. I removed twenty-five ounces of fluid. Strange to say, we never had any return of the vibration throughout the progress of the case. The fluid collected and re-collected, and we removed it on three or four occasions.

I think that possibly we may account for the persistence of vocal fremitus in some of these cases of pleuritic effusion by the existence of adhesions of the lung to some parts of the chest-wall.

Whenever pleuritic effusion is great there is *displacement of viscera*. The heart is often found beating to the right of the sternum when the effusion is on the left side, and this displacement is great where the effusion has been rapid. There are also displacements from the diaphragm being pushed down. But, independently of the fact that displacements may be due to the presence of solid matter in the chest, it frequently happens that although there is a good deal of fluid in the pleura, there is but little visceral displacement. In the first place the heart may be so connected with the chest-walls by adhesion that it cannot be displaced except to a slight extent; and, further, in the more chronic cases, the lung yields to the pressure of fluid, collapses, and thus leaves a large space for the fluid. The displacement of viscera may therefore be much less than you would expect from the quantity of fluid which, after operation, you find has existed.

Again, you must not always expect to meet with any decided increase in the size of the affected side, or a *bulging of the intercostal spaces*. Setting aside the fact that measurements are not always trustworthy, it is undoubtedly true that in adults effusion may be very great and yet there may be no increase, as shown by the tape, in the size of the affected side, as compared with the opposite one. In the more yielding chests of children it is otherwise, and a notable increase is more frequently met with. Doubtless in most cases, if you watch them from the beginning, having taken the measurement before effusion, you

will find an increase in the size of the affected side. But what I wish to impress on you is this, that in the more chronic cases the side of the effusion often measures less than the opposite side. As an instance, there is the case which you have seen in No. 10 ward. In this man, who was the subject of extensive empyema of the left side, the measurements before tapping were as follows:—Right side, 1 ft. 5½ in.; left side, 1 ft. 5 in. We drew off 58 oz. of pus from the left pleural cavity.

Now it is very probable that the measurements of the left side were greater than in health, before the effusion took place; but the left lung being crippled, the right had taken on increased action, and had distended that side of the chest beyond the normal.

Further, although the intercostal spaces are at times altered in their appearance, becoming more or less convex, yet extensive effusion may exist in adults without any such change taking place.

It is scarcely necessary for me to allude to *ægophony* as a sign of pleuritic effusion. I look upon it as a mere fancy sign, being generally absent when there is any difficulty of diagnosis.

I have thus endeavored to deal with some of the difficulties which you may meet with in the diagnosis of pleuritic effusion, and whilst I admit that in the majority of cases the diagnosis is easy, I venture to say that in others it is very difficult; indeed, I think in some instances it is impossible to say positively whether fluid is present without making an exploratory puncture, and in all cases of doubt, where the propriety of tapping the chest is in question, no decided opinion should be pronounced until a fine aspirator-tube has been introduced. But I must say a few words about this preliminary exploration. Simple as it may appear, easily as it is accomplished, and usually attended in hospital practice with but little trouble, it is far less simple amongst private patients. It becomes, in fact, magnified into an "operation," and should no fluid be withdrawn the confidence of the patient is not increased in the physician. Therefore it is well to weigh carefully every feature of a case before introducing even the finest canula. I believe, however, that no harm is done by the use of these tubes, even if a solid lung, or solid tumour, or even a healthy viscus is punctured. You need not therefore be under any apprehension on that score.

But I must tell you that when there is a good deal of fluid in the pleura, one, or even two punctures may fail to withdraw any of it. You may possibly puncture at a spot where there are adhesions; and, again, you may find that, even when there is a pure serous effusion, such as you would think ought to flow through a fine canula, nothing will follow the introduction of the tube unless the exhausting syringe is used. I had under my care a man who, having had empyema of the right side, had symptoms of pleurisy on the left. On examination I diagnosed the existence of effusion. I introduced a fine aspirator-canula, and I felt that I had passed the instrument into a cavity, but no fluid oozed out. I withdrew the canula to see if it was plugged, but it was free. I reintroduced it, but still there was no fluid. The aspirator was applied, and twenty ounces of clear serum were drawn off. Sometimes from the extreme thickness of the thoracic walls it is necessary to pass the canula very deeply before you feel that you have reached the cavity of the pleura. You

may recollect the case of the man N—who was under my care in No. 10 ward. He had been previously tapped for empyema, and he had the signs of a re-collection of the fluid. I introduced a canula into the back of the chest. I felt the instrument entering a soft substance after having passed some distance through the chest-walls. I moved the canula about, but clearly it was not in the pleural cavity. Had I made a mistake? Had I punctured a solid lung? The canula was already buried nearly two inches in the chest walls. I pushed it further, and had the satisfaction of finding that it entered a cavity. I drew off forty-five ounces of thick pus. When you puncture the chest, if nothing but blood or bloody matter exude, it is well to examine the contents of the canula under the microscope, for such examination may enable you to differentiate between a cancerous and some other tumour. At the same time, it must be borne in mind that a cancerous lung may be punctured half a dozen times without a cancerous portion being reached, and cancer may exist although only blood is drawn off.

What I have said as to the non-passage of fluid through a canula will teach you not to trust to the mere introduction of a grooved needle as a means of diagnosis. Some physicians use the small syringe employed for hypodermic injections.

I must now pass on to say a few words about the treatment of pleuritic effusions, and my remarks will be confined chiefly to those effusions which are more or less chronic. As a matter of fact, acute primary pleurisy is a rare disease. Pleuritic inflammation is usually connected with some constitutional state, some constitutional vice, and is more or less secondary. In reference to the more chronic cases, the treatment I have found most useful for promoting absorption of the fluid is the internal administration of iodide of potassium with tonics, bark, &c. Iodide of iron or the tincture of the perchloride of iron may sometimes be given advantageously, and counter-irritation should be used. I prefer for this the application of iodine rather than blistering, but blistering is often useful. I recommend you, however, not to blister severely. I have seen very extensive effusions which had lasted for many weeks—even months—removed by this kind of treatment, and it is well, unless certain urgent symptoms are present, to give constitutional measures a fair trial before resorting to tapping. I must tell you that I have no faith in the powers of mercury to produce absorption of these effusions, and I am not in the habit of prescribing it. I think it is important to keep up the strength of patients, for there is a far greater probability of the fluid being absorbed when they are strong than when they are weak, and therefore good diet should be given, with tonics, and even wine, whilst the special remedies are administered.

The last points I wish to refer to are the propriety of tapping in these affections, and the period when the operation should be resorted to.

There can be no doubt that many cases of extensive pleuritic effusion have been lost from the operation of tapping having been either too long delayed or not performed. When the effusion is great there is danger of fatal syncope or fatal dyspnoea, and one or other of these may occur, although there does not appear to be any serious interference with the breathing, especially if the

patient is somewhat advanced in years or debilitated. The danger of delay is well illustrated by many cases recorded by Trousseau and others. Let me refer to one. A patient was under my care some years ago in the Northern Hospital, with pleuritic effusion. I was trying general measures, intending to tap in a day or two if there were no improvement. One morning the man was seized with a sudden attack of syncope and died. A large quantity of fluid was found in the chest.

Now as to the time at which you should tap in pleuritic effusions. I think you should tap in all cases, of *whatever duration*, whether acute or chronic, where the accumulation of fluid seriously compromises respiration, and especially if there have been any sudden attacks of dyspnoea. Again, wherever an extensive effusion has lasted some weeks, and shows no signs of diminution from general treatment, tapping should be resorted to, whether dyspnoea is present or not. It is not necessary to remove the whole of the fluid, indeed it is better not to do so if the effusion is large, for reasons which I will mention presently. The removal of a portion of the fluid usually has the desired effect, and seems to stimulate the process of absorption of the remainder, and to cause the general measures to act with greater success. There is one rule you should always observe. You will find that the patients, after a certain amount of fluid has been withdrawn, will often complain of a sensation of constriction across the chest or epigastrium, or of pain. Under either of these circumstances the operation should be at once stopped.

As regards the site for tapping, I prefer, under ordinary circumstances, that recommended by Bowditch. The rule is to find the inferior limit of the sound lung behind, and to tap two inches higher than this on the pleuritic side, in a line perpendicular from the inferior angle of the scapula.

With ordinary care, and especially by using the aspirator, no air need enter the chest in the operation.

I have never in my own practice, and I have now tapped many times, seen any bad results from the operation, and this is the general experience; but still some instances are recorded where death has followed very soon after tapping, probably either from syncope or from the presence of clots in the pulmonary vessels. One such case occurred in this hospital. A considerable quantity of serous fluid had been drawn off from a man, and he was left apparently well. In the course of about half an hour, however, he was dead. Whilst therefore I consider the operation essentially safe, it is well to bear in mind that it is not always unattended with danger; and in order to avoid as much as possible all risks, I advise you to draw off the fluid, especially when it is serous, by a small canula, and not to take away too much at once; rather, in fact, to repeat the operation, if necessary, than disturb too much the existing relations of the lung.

In the treatment of empyema there are two methods which you may adopt. First, the treatment by constant drainage through a tube introduced into the chest; and, secondly, the treatment by repeated tapplings. I have seen both these methods succeed, but I must defer the consideration of this subject to another lecture.

# A Clinical Lecture

ON

## A CASE OF ANEURISM OF THE COMMON FEMORAL ARTERY.

By EBEN. WATSON, M.A., M.D.,

Professor of Physiology in Anderson's University, and Surgeon to the Royal Infirmary, Glasgow.

GENTLEMEN,—It is often more interesting to see the end of a case than the beginning, and certainly it is profitable for you to mark the results as well as the proceedings of surgery. Hence I have brought before you to-day, for re-examination, a man on whom most if not all of you saw me operate last summer, and whose case you then watched for several weeks with lively interest. I hope you will now find it of advantage to look back on the case, and consider with me the lessons which it teaches and the features in its progress, which none of us found very easy of explanation at the time of their occurrence. Moreover, the treatment of aneurism is one of those old subjects which must ever be coming up for new study. Indeed, more than usual attention has been recently given to it, and some novel suggestions have been made which are worthy of careful consideration. In the comparatively limited field of the surgical treatment of such cases, it must be confessed that the ligature is at present on its trial, and many are already disposed to cast it aside for pressure in some of its forms. Different kinds of ligatures, too, have been at various times employed with a view to diminish the acknowledged dangers of the operation, and these have a peculiar interest in our day as part of the so-called antiseptic system of surgery.

The patient, Thos. M'C—, aged thirty, a shoemaker by trade, was admitted into the Royal Infirmary under my care on the 1st May, 1875. He had a very large aneurism of the common femoral artery on the left side. It is stated in the ward journal that the patient observed this tumour "about four months ago," and that it was then "the size of a marble." He says it increased slowly till within a month of his admission, when it grew very rapidly larger and more painful. Patient had been advised to rub it with iodine ointment, and, perhaps owing to his having done so rather vigorously, the tumour, when we saw it, was not only very prominent, but had a considerable elevation from its surface, over which the skin was red and glossy, like the pointing of an abscess. The measurements of the tumour were four inches and a half long and five inches broad, but I never thought that these gave an adequate idea of the size of the sac, for it could be felt deep in the thigh and also passing up beneath Poupart's ligament, where its exact limits could not well be ascertained. You will remember that it exhibited all the phenomena usual to aneurisms, but as we carefully noted these at the time, I need not now dwell on them, except to remark that all the signs referred to were present in a very exaggerated form, owing to the size of the aneurism and the thinness of the skin covering it. I wish, however, to remind you

of a fact which I think of importance, as leading to the explanation of the future progress of the case—viz., that we could from the first differentiate two distinct parts of the aneurismal tumour, one which was deep, broad, somewhat flat in shape, and not easily measured, the other which was more superficial, protruding from about the centre of the deep part, and from which arose the lesser prominence mentioned previously, with red skin and apparently on the point of bursting. Besides, in this more superficial portion the blood could be felt quite fluid, while in the deeper part it seemed to be more solid, as if the blood there was in that loose friable state of coagulation described by Broca as common in large sacs.

As time was of great importance in the treatment of such a case, I at once determined, with the consent of a consultation, to tie the external iliac at its upper part. I think it was obvious to everyone who saw the case that no other practice would have been safe in the circumstances. It was not a favorable case for pressure; its size and position forbade opening the sac, and the condition of its coverings alone would have prevented me from trying any kind of puncture, whether simple or electrolytic. On the 5th of May, then, I tied the external iliac above its middle as required by the upward extension of the aneurism. I need not detail the steps of the operation. No difficulty was experienced, but I may mention that I in this case employed a silk ligature which had been drawn through melted wax and carbolic acid. My reason for doing so, instead of employing prepared catgut, will be explained by and by. I cut the ends of the ligature short in the wound, and brought it together with stitches of silver wire, leaving some loose at the upper end, which was most dependent as the patient lay in bed. I likewise introduced at this end a drainage-tube to some depth, in order to ensure the free escape of the early discharge which always occurs from such a wound. I need hardly say to you that all these proceedings were done under the carbolic spray, except the cutting part of the operation. Gauze dressings were then applied as usual. Immediately on tightening the ligature the pulsation in the aneurism ceased, and it is noteworthy that it never recurred during the progress of the case. The tumour rapidly diminished in size, and we were all pleased to notice how the appearance of pointing subsided, and the skin became very soon as pale and natural as that of the surrounding parts. The temperature of the limb was easily maintained, and the general health and spirits of the patient improved daily.

The drainage-tube was withdrawn on the 7th of May—i. e., on the second day after the operation, as there was then no discharge at all from the wound. On the 18th inst., it is noted in the ward journal that a little semi-purulent fluid was found on the dressings "for the first time since the operation." This discharge was very trifling in amount, and ceased altogether in a few days; but it was carefully examined every day, and nothing like the ligature was ever found in it.

The tumour at this time followed rather an unusual course, for though greatly diminished, it still remained of considerable size—I should say it was about as large as a lemon. Its deep part had already consolidated thoroughly, but the more superficial portion continued fluid and prominent for some time longer; or, rather, after partially

solidifying, it seemed to become more fluid than ever. The skin over it was pale and healthy, and there was not the slightest thrill of pulsation to be felt in any part of it. You remember I found this state of matters rather puzzling at first, but on reflection I came to the conclusion that this prominent part of the tumour had become changed into a blood-cyst, such as often occurs during the absorption of clots elsewhere, notably in the female mamma, the ovary, and the brain.

My idea was that before I ligatured the artery the aneurismal sac had burst into the areolar tissue, where it formed a secondary sac on the top of the primary one. It was over this that the skin was red, and like that of a pointing abscess. After my operation the blood coagulated as usual in the primary sac, as I shall call it, filling it up, and becoming in due time organised into fibrous tissue; while in the secondary sac we had rather the course of an extravasation followed than that of an aneurism. In it the outside layer of blood alone became organised so as to form a fibrinous sac enclosing stagnant fluid blood, which, I doubt not, became changed in the usual way; the corpuscles disintegrating and yielding up their hæmatin, to be dissolved in the serum. In short, we very soon had a cyst containing red serum between the skin and the real aneurism.

I believe—as indeed I told you at the time—I might have safely drawn off this fluid by the aspirator; but I preferred the safer practice of applying pressure, which I did by means of a bag of sand laid upon the tumour. I am not certain of the exact date when this treatment was commenced, for unfortunately it has not been noted in the journal; but on the 2nd of June it is recorded that compression had been employed “for the last few days,” and that already the tumour had diminished in size. This diminution was so rapid that by the 12th of June the prominence was compared in size to a walnut, and in a month from the commencement of the treatment its relic was only to be detected by careful examination.

The deep tumour had by this time likewise diminished very much, and was quite firm to the feeling. In fact, the man might have been dismissed cured by the middle of July, but was kept in the hospital for the sake of observation. You may remember that even before that date he had made himself very useful in the ward, and was an excellent assistant at some of our operations.

I ought to have mentioned before this that late in the history of the case it was found that a small aperture existed in the upper part of the cicatrix of the operation wound, and led to a sinus about two inches long. It was so narrow as only to admit a small probe; but it was very troublesome to heal; and, after trying milder measures, I was at last obliged to lay it open; it then healed quickly enough. I cannot be certain as to the cause of this sinus, but I am sure it was not in any way due to the silk ligature, for it was quite superficial, and the ligature had long been covered by the tissues before it was detected.

I now ask you to consider what has become of the ligature? It could not have been discharged without our seeing it, for we examined every dressing with great care, and I therefore believe that it is still retained. I do not know of any observations that would lead us to suppose that silk may be liquefied as we know catgut is, and therefore the ligature in the present case could neither

have come away in a fluid form nor been absorbed. Far less could it have become transformed into fibrous tissue; but I think it accords with the present state of our knowledge to believe that its filaments have been separated and surrounded by the fibrous elements which have been formed out of the exudation-matter present in the wound; and that thus, so far changed and enveloped in the tissues, it may remain for an indefinite period without coming to the surface or causing irritation. From following my practice, you know how much the antiseptic dressings assisted in bringing about this result; for they prevented the destruction of the exudation, and preserved it all, or nearly all, for organisation. But had they not been thus successful, and had free suppuration been permitted in the wound, then I am sure the ligature would have been discharged as in olden times. If such had happened in our case, it would have been clear that the ligature had ulcerated through the artery; but as things really stand, this is not at all clear. Nay, I think the ligature has not cut the artery, but still encircles it; for the behavior of such a ligature as ours, when treated antiseptically, must be very different from that of an ordinary ligature treated without antisepticism. In the latter case it must cut, and is made to cut the artery, but in the former it is shortened and left among the tissues, and kept free from all causes of irritation. It only compresses the arterial tube. It does not drag upon it, and therefore whenever the coats of the artery have accommodated themselves to the compression, which their elasticity enables them soon to do, they no longer feel it. They do not necessarily die under it; for if they did the ligature would come away, which it did not do in our case. So far therefore as it goes, this case proves that an antiseptic silk ligature may effectually compress an artery without killing or cutting its tunics.

You may now ask, What, then, are the advantages of the silk over the catgut ligature? I answer that, in my opinion, these are two in number—viz., first, the silk ligature, by its more decided pressure, is more likely than the catgut to rupture the internal, and perhaps part of the middle, coat of the artery, thus making the closure of the vessel more secure. I have found on dissection that the catgut ligature has no such effect on the coats of an artery. Secondly, and perhaps more importantly, the silk ligature holds the artery for a longer time than the catgut. We know that the latter becomes softened in a few hours, so as to lose its compressing power, and it is very soon thoroughly liquefied.

These points are both well illustrated by the preparation which I now show you from our excellent pathological museum. It is that of the iliaco-femoral artery taken from a case which occurred to me some years ago, and an account of which was published by me in the *Glasgow Medical Journal* for May, 1870. This artery was ligatured by myself in two places at two different times with prepared catgut, and you will perceive that at these places the calibre of the vessel is quite undiminished, and its lining membrane quite smooth, and only slightly reddened. I may add that it was found at the inspection quite empty. Now all these circumstances indicate that the ligature had not ruptured any of the arterial coats, and that it had held the vessel for too short a time to permit a clot to adhere to its lining membrane. Failure

was a necessary consequence, and it was to avoid such an occurrence again that I employed a prepared silk ligature in the case now under consideration. I am glad that the practice has been so successful.

I must now add a postscript to the history of the case already given, and, like many postscripts, it may be thought by no means the least interesting or curious portion of the narrative.

When I left Glasgow in the beginning of August last for my holiday trip I considered M'C——'s case as concluded, and concluded satisfactorily: but, much to my surprise, on my return to the hospital upon the 3rd of September, I was told that the aneurism had returned. Of course I very soon carefully examined the patient, and found the following state of parts.

In the left groin, about an inch and a half below Poupart's ligament, and rather to the inside of the hard relic of the former aneurism, there was a small pulsating tumour, nearly globular in form, and about an inch in diameter. It had lateral as well as vertical pulsation, synchronous with the radial pulse, and a faint bruit. It could be very easily emptied by direct pressure on the tumour, and on removing the finger it at once refilled. Lastly, this pulsating tumour had only been observed for about a fortnight before my return to Glasgow.

I could not but agree with the opinion that this was again an aneurism, but it was difficult to decide whether it was part of the old sac opened out again or altogether a new sac, and, in any case, what artery was involved. For, on careful examination, I could feel no pulsation in the left iliac or common femoral arteries, while on the right side both were easily felt. Hence I concluded that the vessel on the left side had been thoroughly obliterated by my operation from the site of the ligature to that of the aneurismal tumour. If so, this new aneurism could not be filled by the direct current of the blood. Could this, then, happen through the re-establishment of the collateral circulation? I think we must suppose so, and this opinion is corroborated by the fact that no pressure which I could make on any part around the tumour at all affected its pulsation. To do this, direct pressure over the tumour had to be employed. No other means would answer, and fortunately that was well borne by our patient. The arterial compressor was kept applied, with suitable intervals of relaxation, for six days; when it was found that the tumour was flattened, the sides of the sac had apparently adhered to one another, and not the slightest pulsation was to be felt.

Now I think this rapid cure indicates that the sac was a recent formation, else it would not so readily have become adherent, and also that the blood current was not so forcible as a direct current through the main artery. If part of the cyst formerly described in connexion with the old aneurism could be supposed to have become opened up once more with blood from one of the collateral arteries, it would, I think, best account for the phenomena of the case, but the explanation supposes an occurrence so unprecedented that I cannot do more than merely suggest it as a possibility.

On the 17th of September the patient went home quite cured, and has since continued his ordinary work, as a shoemaker, with perfect ease and freedom from all his former symptoms. A hard

tumour, the size of a field bean, may yet be felt in the site of the former aneurism. Such is the state of matters at the present date (December 3, 1875), as you are aware from personal examination of the patient.

## Lectures

ON

## INDIVIDUAL HYGIENE.

*Delivered at St. Bartholomew's Hospital,*

By REGINALD SOUTHEY, M.D., F.R.C.P.,

Physician to, and Lecturer on Forensic Medicine and Hygiene at the Hospital.

### LECTURE I.

HYGIENICS is a term which may be arbitrarily employed to comprehend a vast series of subjects, upon which more accurate knowledge is much needed at the present day.

For convenience, again, we may establish three great departments of hygienics. (1) *General hygienics*. The study of the effects of external influences upon the health of man. The hygiene of the house or habitat and surroundings—*circumstantia vite*—a subject upon which I lectured last year. (2) *Individual hygienics*. The study of individual construction—the living machine—man himself, his form and attributes,—the subject which I have selected for my present course. (3) *Administrative hygienics*. The knowledge of the factors of health applied for its promotion; a subject which I reserve to discuss until politicians handle it. When they show how the necessary money is to be raised to pay for sanitation, medical men will not be behind-hand to advise statesmen how they had best apply it.

As an introduction, I will premise a few remarks upon health; to decide, if this be possible, what it is we seek in health, and how we are to appraise it; how to examine any individual so as to determine his particular measure of health.

It is a far more easy thing to ascertain the health-rate of a town or population than of an individual. The inference follows, then, directly upon established facts. Death-rates; mean death age; mortality at different periods of life; returns of sickness. But from what data will you appoint an individual health-rate? What standard are we to set up? Are we all agreed upon an ideal health as something separate from a realisable measure of health?—since this last is what we must rest content with. The scale of health can only be graduated by degrees of disease, or degrees of immunity from disease.

Health and longevity are not synonymous, neither are health and great muscularity. The most muscular men, great prize-fighters, men who could fell an ox with their fists, have been known to be always ailing and complaining about themselves. The state of perfect training, regarded by those who know little of it as a condition of most perfect health, is rather one of morbid imminence.

Longevity, like height, is a race attribute, but it



does not signify health. The three oldest people I ever knew, women who reached respectively eighty-nine, ninety-eight, and a hundred, were valetudinarians, and had been so nearly all their lives.

I wish you to perceive that while a great deal of sickness may be compatible with long life, and a huge amount of disease is preventable and quite unnecessary, there must still always remain a fair quantity of illness which has to be accepted as the allotment of the sons of Adam, which will lay a man by for some few days every year of his life, which will confine him to house or bed now and then as he advances in years, and which he can neither prevent by any care he takes of himself, nor avoid by following the guidance of the very best *Æsculapius*.

The conditions under which life is held make it a tenancy, not a freehold.

But we may profitably occupy ourselves in scrutinising men like machines, and noting what is good and what bad in construction, what kind of build of body is adapted to fulfil good mental and bodily work, to endure long, and waste very little, if treated fairly.

Insurance offices mean by average healthy lives persons who at the date of their examination show no sign of disease, and the history of whose past lives, as well as that of their families, exhibits no proclivity to early death.

When Government advertises for smart young men for active service, it is understood to require persons who can endure fatigue and stand ordinary exposure without breaking down.

Celsus has defined health so well that I may quote him to you. He says:—"Sanus homo qui et bene valet et suæ spontis est, nullis obligare se legibus debet, ac neque medico neque iatralipta egere." And then continues, "Hunc oportet

be? His ideal is more exacting, if his advice is less generous, than that given by the old Latin physician. The hygienist defines health as comparative exemption from disease at each period of life; he regards it as an abstract quality of the body, just as virtue is of the mind, arising out of a perfect adjustment of the several component parts towards the requirements of the whole.

If this be allowed, let us next inquire how we are to discover and appoint this quality of body. What form or appearance of man is most likely to possess it? Will he be a *bel homme*, or a Hercules, with broad shoulders, short thick neck, and small round head? Be an Apollo or an Adonis? If a woman, will she be exquisitely proportioned like the Venus of Praxiteles? It is at least probable that such an exterior as artists and sculptors admire will coincide with health, for beauty in form usually accompanies the adaptation of means to ends, parts to purposes; but if you understand health to be comparative immunity from disease, and a disposition to resist it, you must not expect this endowment will find immediate or precise expression in either form or feature. Nay, I shall go further, and say that disease is so subtle a thing that you cannot estimate any individual's health at a mere glance. You may make a guess, and perhaps a shrewd guess, if you have had experience of disease, and some practice in examining persons. But unless you have learnt what to look for and how to examine, your opinion upon any individual's health, present or prospective, will not be valuable. My object to-day is to teach you how to make it so.

The ideal of health is, after all, nearly what common sense teaches us it should be—a body that functions (as the Americans phrase it) well and unconsciously, and possesses recuperative powers in store.

| AGE. | WEIGHT.  |          |          | HEIGHT.  |          |          | GIRTH.   |          |          |
|------|----------|----------|----------|----------|----------|----------|----------|----------|----------|
|      | Average. | Maximum. | Minimum. | Average. | Maximum. | Minimum. | Average. | Maximum. | Minimum. |
|      | st. lb.  | st. lb.  | st. lb.  | ft. in.  | ft. in.  | ft. in.  | inches.  | inches.  | inches.  |
| 18   | 8 10·79  | 10 13    | 6 6      | 5 4·34   | 5 11     | 4 10½    | 29       | 31½      | 27       |
| 19   | 9 4·11   | 12 8     | 7 4      | 5 4·94   | 5 11½    | 4 11     | 32       | 34       | 29       |
| 20   | 9 5·58   | 12 8     | 7 13     | 5 5·11   | 5 11     | 5 1      | ...      | 33       | ...      |
| 21   | 9 5·02   | 12 0     | 7 3      | 5 5·57   | 5 11½    | 5 0½     | ...      | 33       | ...      |
| 22   | 9 12·41  | 13 2     | 7 7      | 5 6·17   | 6 1      | 5 0½     | 33½      | 34½      | ...      |
| 23   | 10 2·95  | 12 12    | 7 12     | 5 6·17   | 6 1      | 4 11     | ...      | ...      | ...      |
| 24   | 10 2     | 12 12    | 7 12     | 5 9·94   | 6 1      | 4 9      | 33       | 33½      | 32       |
| 25   | 10 5·65  | 13 8     | 8 2      | 5 6·30   | 6 0      | 4 11     | ...      | 34       | ...      |
| 26   | 10 1·06  | 13 8     | 6 12     | 5 6·28   | 6 1½     | 4 9      | 33       | 33½      | 32½      |
| 27   | 10 4·75  | 13 10    | 7 12     | 5 6·38   | 5 11½    | 5 1      | 31       | 32       | 27       |
| 28   | 10 2·62  | 13 2     | 7 7      | 5 6·65   | 6 1      | 5 1      | 33½      | 38½      | 33       |
| 29   | 10 5·53  | 13 12    | 8 4      | 5 7·02   | 6 0½     | 5 1½     | 33       | ...      | ...      |
| 30   | 10 1·55  | 14 1     | 8 1      | 5 6·36   | 6 1      | 5 0½     | 35       | 36       | ...      |

varium habere vitæ genus, modo ruri esse, modo in urbe, sæpiusque in agro, navigare, venari, quiescere interdum. Siquidem ignavia corpus hebetat, labor firmat; illa maturam senectutem, hic longam adolescentiam reddit."

No definition of health could be more apt than youth prolonging its activity into a green but timely old age. He does not say long life, great strength, lots of money—the fool's earthly paradise; but to feel well and be your own master. But what does the hygienist understand health to

The following are the chief things to be noticed in estimating the construction of any person's body:—The age, the weight, height, and girth of chest, have all to be taken into account. They bear a certain definite ratio to each other in well constructed bodies, and you may learn what these proportions are from the table I have hung up.

You should estimate the girth at two different levels: first round the mammæ, the tape passing just above the level of the nipples; and, secondly,



at the level of the xiphoid cartilage. The upper girth should exceed the lower.

The next thing to ascertain is the mobility of the chest. Mere girth will not give you what you seek to know, which is the amount of air ordinarily changed at each respiratory act, and the maximum mobility, or the greatest amount which can be changed. For instance, a 30-inch chest-girth which expands only two inches to 32 after deepest inspiration, is capable of changing less air than one measuring 29 inches and expanding to 33 inches. Hutchinson found that the thorax presented the greatest capacity in men whose height ranged between 5 feet 6 and 5 feet 8 inches; and that it was relatively smaller in men measuring between 5 feet 8 and 5 feet 10 inches.

Again, above the weight of 11½ stone (= 161 pounds), the circumference of a man's chest ought to increase about 1 inch for every 10 lb. in weight, and for every inch in height over 5 feet 8 inches the mobility of the chest should increase in definite ratio.

What Hutchinson called the vital capacity, and estimated by his spirometer, a floating cylinder which was raised from its bed like a small gas-meter, by being filled with air from the mouth, is the fullest measure of air a man can expire after the deepest inspiration. It is not so valuable a test as it ought to be because there is a good deal of knack required in blowing to one's bellows power. I do not intend to occupy your time with a lecture upon the examination of the chest, however. I only desire to call your attention to the data requisite for arriving at an opinion upon the probable health of any individual.

Take (1st) as items of unfavorable augury, a weight at all below the average, which should correspond with the height—important in the degree in which it is constant; (2nd) a thoracic girth not commensurate with the weight; (3rd) any chest-girth in an adult less than twenty-eight inches; (4th) a thoracic mobility between deepest inspiration and fullest expiration measuring less than three inches.

But it is not merely by stripping, weighing, and measuring a man that you estimate what he is worth—you must make him quicken his circulation, and then examine his heart and pulse and auscult his chest; you must feel over the heart and large vessels for impulse and thrills; a certain amount of pressure should be borne over the heart and chest without interfering with the heart's action; its rhythm should be regular, its impulse not excessive, its sounds distinct and clear. There are many other things you must notice as well—the shape of the abdomen, which ought not to be prominent, the limits of liver and spleen, the hernial sites, the general formation of spine and chest and feet, varicoele and piles, obesity and leanness. There are features about a pulse you have to value; one that is succinct, firm, and regular, rendered fuller by feeding, thinner by fasting, altered in rapidity by posture; but, however quickened, that should always be distinct. Temperature, too, appoints a great deal; while high temperatures suggest the febrile state, low temperatures often signify existing thoracic disease or a feeble state of health. I have observed that the subjects of chronic peritonitis, of brain-softening, of diabetes, and of renal disease, usually present temperatures below normal.

Again, the stability of the axillary temperature,

when a person is exposed to circumstances which tend to depress it, such as resting one foot upon a block of ice—the test, if you remember, which Back applied in selecting sailors for an Arctic voyage—would be a valuable criterion of both a sound circulation and a good nervous system.

Lastly, you should practise yourselves in estimating the mental as well as the bodily health; for, as the Latin Grammar taught you, the *mens sana* is only found in *corpore sano*.

In summary, let me repeat that a sound constitution depends upon a body well constructed both inside and out, and upon a balance of functions, circulation, respiration, innervation, digestion, sanguification, each well, all unconsciously fulfilled; upon a temperature well maintained all the body over; and last, but by no means least, upon good habits of life. A man, as Celsus said, is not to live too much by rule; he should be the master, not the slave, of his body.

The state of health is a state of very perfect hæmotosis, in which the tissues of the body are neither too moist nor too dry. Flabby muscles and hydræmia of the intercellular tissue are suggestive of debility if not of actual disease. There appears to be a maximum of solidity, a ratio between weight and height and girth, which coincides with that period of life when the energy or vigor is greatest, when each individual is capable of his greatest feats of strength and endurance; it is better marked in males than in females, and happens at or about the thirtieth year of life. This is the quality of body which the hygienist aims at prolonging.

The following signs may be accepted as evidence of sound health:—1. Individual adaptability: the capacity in man to adapt himself to extremely opposite conditions of existence without suffering in energy. 2. Endurance: the capacity of supporting considerable bodily or mental labor without suffering from fatigue, or of repairing the latter quickly. 3. Self-command: the capacity of controlling the emotions, blunting as well as sharpening the sensations at will. 4. Resistance to morbid influences: the capacity of eliminating all poisons quickly by dint of sound organs of excretion.

The following signs of debility ought to be enumerated as well:—1. Deformity; obesity; leanness; bad construction of the skeleton or of its clothing. 2. Personal inadaptability: liability to disturbance of either mind or body upon slight provocation, such as change of food, clothing, climate, or any interruption of the ordinary habits. 3. Lack of endurance: small staying powers, requiring long rest to repair fatigue. 4. Small emotional control: the persons who are quickly provoked to anger, or are speedily moved to tears or laughter, exhibit feeble nervous systems, and are prone to nervous disorders. 5. Propensity to morbid influences: those whose organs of sanguification or of elimination are damaged; who, although equal to ordinary calls upon them, exhibit their inefficiency by succumbing to every contagion, miasma, or poisonous influence that they encounter.

## Clinical Lecture

ON THE

### DIAGNOSTIC VALUE OF THE ILIO-FEMORAL TRIANGLE IN CASES OF INJURY OF THE HIP-JOINT,

#### MORE PARTICULARLY OF IMPACTED FRACTURE.

*Delivered December 16th at Guy's Hospital,*

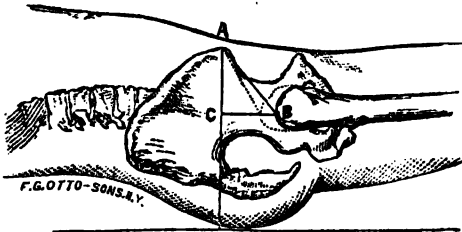
By THOMAS BRYANT, F.R.C.S.,

Surgeon to, and Lecturer on Surgery at, Guy's Hospital.

"THE interest that is attached to the subject of injuries of the hip-joint, the difficulty that occasionally attends their diagnosis, and the injury that is too often inflicted upon a patient in the attempt to make out a difficult case, are some of the reasons that have induced me to bring before your notice on the present occasion a means of diagnosis in these cases that I have long employed and taught, although I may not have formulated it before the present year.

I have described the means in this paper as the ilio-femoral triangle, and I have done so because the triangle is formed between the ilium and the femur. The lines which form it are readily made out, and any shortening of the one which I have called the base, and to which I am about to draw your especial attention, can be easily detected.

The triangle is formed as follows, and is a right-angled triangle. It is figured below. One side of the triangle is represented by a line A B, drawn from the anterior superior spinous process of the ilium, to the top of the trochanter major. The



second, A C, is drawn from the anterior superior spinous process of the ilium directly downwards to the horizontal plane of the recumbent body. And the third, C B—which is the base of the triangle—is drawn at right angles to A C, and falls upon the line A B, where it touches the great trochanter. It is to this line my observations refer.

The line A B, it will be seen, corresponds in part to Nélaton's well-known line, which is drawn from the anterior superior spinous process of the ilium to the most prominent part of the tuberosity of the ischium. This line, in the normal position of the head of the femur, touches the upper border of the major trochanter in every position of the limb, and I believe that if this line is to be considered to be the test-line for dislocation of the head of the femur backwards—which I take it to be—I must claim the base of the triangle I

have described (C B) to be the test-line for fracture or shortening of the neck.

At any rate I can confidently assert, after repeated proofs, that whilst in a healthy subject these ilio-femoral triangles are exactly similar upon the two sides of the body, with equal sides and equal angles, I can with equal confidence assure you that in all cases of injury to the hip in which shortening of the neck of the thigh-bone exists, the amount of shortening can readily and accurately be made out on comparing the bases (C B) of the triangles of the two sides. That in impacted fracture of the neck of the thigh-bone, where on the sound side the base of the triangle will, in the adult, measure its average normal length of two and a half inches, on the affected or injured side it will measure from half an inch to more than one inch less. These measurements being taken with the patient in the horizontal position, the pelvis straight, and the two femora parallel.

I will now proceed to illustrate the practical bearing of these facts by the quotation of a few cases of impacted fracture of the neck of the thigh-bone, as it is in cases such as these that the value of the test-line I now submit to your notice is best illustrated.

CASE 1.—Mary C—, aged sixty, was admitted into Guy's Hospital, under my care, on May 5th, 1872, having had a severe fall upon her left hip. On admission her left lower extremity was everted, and three-quarters of an inch shorter than her right; this shortening being in the neck of the bone, as shown by the trochanter major being drawn up to that extent, as proved by the test-line. The head of the bone rotated smoothly in the acetabulum. An impacted fracture was diagnosed, and a long splint applied. The woman left the hospital in two months convalescent, and able to use her limb. The shortening, however, remained the same, and there was great thickening to be felt about the neck of the bone behind the trochanter.

CASE 2.—Ann F—, aged sixty-eight, a widow, was admitted on April 18th, 1872, having two days previously fallen upon her hip against a bedstead. On admission her right lower extremity was everted, and shorter than the left by three-quarters of an inch. The shortening was also found by the test-line to be in the neck of the femur; the head of the bone could be rotated in the acetabulum. A long splint was applied to keep the parts quiet, and in ten weeks the patient was convalescent. She left the hospital able to use her limb. The shortening, however, remained, and considerable thickening about the neck of the bone was to be felt.

CASE 3.—Charlotte H—, a servant, aged fifty-nine, was admitted on March 6th, 1873, for a severe injury to her right hip, which she received in a fall. On admission the limb was everted, and three-quarters of an inch shorter than the left, the trochanter being nearer by that extent to the crest of the ilium, as indicated by the test-line. A long-splint was applied, and rest enforced, the woman leaving the hospital in two months able to use her limb. The shortening, however, still existed, with much thickening about the neck of the thigh-bone, and the trochanter major was clearly nearer the median line of the body on the affected than on the sound side.

CASE 4.—Margaret S—, aged seventy-eight, was admitted on June 2nd, 1873, having fallen

heavily upon her left hip. The left lower extremity on examination was in a natural position, the foot being straight; it was nearly three-quarters of an inch shorter than the right, and this shortening was in the neck of the bone as indicated by the test-line. Pressure upon and behind the trochanter caused pain. A long splint was applied and kept on for two months, when it was removed, the patient being able to get about on crutches. The shortening of the limb remained; there was considerable thickening about the neck of the injured femur.

CASE 5.—W. D. G.—, aged sixty-three, was admitted on April 5th, 1873, having been knocked down by a cab. The injury was in the right hip. On admission the limb was slightly everted and three-quarters of an inch shorter than the left, the trochanter major being drawn up nearer to the crest of the ilium, as shown by the test-line. Pressure behind the trochanter and upon it caused pain. A long splint was applied, and in two months the man left the hospital, the shortening being about an inch. There was great thickening about the neck of the bone.

CASE 6.—Patrick W.—, aged sixty-four, was admitted on Jan. 11th, 1873, having fallen heavily off the kerbstone upon his right hip. On admission the right lower extremity was one inch shorter than the left, and the shortening was to the neck of the bone, the base of the ilio-femoral triangle on the injured side being one inch less than that on the sound one; the foot was slightly everted. Pressure caused pain behind the trochanter. An impacted fracture was diagnosed, and a long splint applied. The man left the hospital convalescent on March 7th with a good limb. A month later, however, he died of bronchitis and old age, and I was fortunate enough to get the preparation which I submit to your notice. It is an excellent one of cured impacted fracture.

These cases are only a few out of many that I could extract from my note-book to support the views I have brought before you; but I trust they are sufficient to justify the opinion I expressed at the beginning of this paper as to the value of the test-line I have described.

In practice the line is easily made out, and the test as to shortening of the neck of the femur readily applied, and with these facts before us the value of the means for diagnostic purposes can hardly be disputed.

In my own hands the test-line has helped me much in many difficult cases, and in the hands of my dressers it has been of no less value, for it has enabled them to diagnose with facility, and without dangerous manipulation, many cases of impacted fracture of the neck of the thigh-bone that would otherwise have been overlooked, and to a certainty would have been roughly and injuriously handled.

By means of this line I maintain the diagnosis of an impacted fracture of the neck of the thigh-bone can, as a rule, be made out with facility and certainty; and that in a large number of obscure cases of injury to the hip the doubts and difficulties that were formerly experienced may be exchanged for the confidence of accurate knowledge.

I do not mean, however, to say that by means of this test-line all obscure cases of injury to the hip-joint can be cleared up, for such an assertion would not be true; but I would wish you to believe what I have found to be the case—that by its

use a large number of cases that would have been called obscure have ceased to be so.

It is true that there may be some shortening of this line in cases of fracture of the great trochanter, and it is likewise possible that there may be no shortening of the line in some examples of impacted fracture; but these cases are exceptional, and they in no way tend to diminish the diagnostic value of the means I have to-day brought before your notice in the majority of cases of fracture of the neck of the thigh-bone, and in all cases in which shortening of the neck of the femur may be found. With these remarks I respectfully commend this test-line to your notice and adoption."

Gentlemen,—The paper you have just heard was read on Feb. 9th, 1875, before one of our Medical Societies;\* and, as it has *not* been published, and recent experience has more and more convinced me of the value of the "test-line" therein described, I have thought it well to bring the matter before you, giving at the same time such additional evidence in its favor as circumstances have afforded me. And, gentlemen, I think I shall be able to show that the opinion I have already expressed concerning the value of the test-line has been satisfactorily proved to be true by the experience of my dressers in the wards of this hospital; for I can tell you, and I do so with much satisfaction, that during the last three years at least sixteen consecutive cases of fracture of the neck of the thigh-bone have been admitted into my wards, and that all these sixteen left them with good union of the broken bone and useful limbs. You must know, also, that all these patients were advanced in years, the youngest having been fifty-nine and the oldest seventy-eight, the average age of the sixteen having been seventy-four.

And bear in mind that the diagnosis in all these cases was made by my dressers with the gentlest manipulation and the simplest means, by means of the test-line I have this day described to you, it having been my privilege only to confirm the diagnosis they had made. The injured patient was simply placed on a firm bed with his pelvis brought to a right angle with the spine, and his lower extremities slightly extended, a tape was then allowed to fall from the anterior superior spinous process of the ilium of one side to the horizontal plane of the body, A C, and a second tape employed to measure the distance between this vertical tape and the upper border of the great trochanter on the same side, O B. (This horizontal line forming the test-line.) Similar measurements being taken on the opposite side.

The two lines on the respective sides were then compared, and when no difference was found between them, it was generally assumed that no fracture of the neck of the femur existed; but when the test-line, O B, on the injured side of the body was found to be shorter than the other, and this shortening had taken place after a direct injury to the hip, the inference was drawn that there was some shortening of the neck of the thigh-bone, and that this shortening was probably due to a fracture; the amount of shortening in the neck of the bone being fairly represented by the amount of shortening in the test-line of the affected side. In many cases, however, no tapes were used, the index finger of one hand being employed to represent the vertical line, with its tip placed upon the an-

\* Royal Medical and Chirurgical Society.

terior superior spinous process of the ilium, and the index finger of the opposite hand as the horizontal test-line, the thumb marking off upon the index finger the distance between the vertical line and the top of the trochanter.

You will thus see that the surgeon has in the line *o b* a ready and simple means of testing the existence or non-existence of any shortening of the neck of the femur. In any case of injury to the hip-joint in which a fracture of the neck of the femur is suspected, impacted or non-impacted, and in which no shortening of the test-line can be made out, the probabilities of the case are greatly in favor of there not being any fracture. Whilst in another case of the same kind in which a marked shortening is found, the surgeon can arrive at no other conclusion than that a fracture exists. Under these circumstances, no case of fracture of the neck of the thigh-bone ought to be over-looked; and in the diagnosis of the case no rough manipulation of the injured limb is ever called for, no looking for crepitus, no forced flexion of the thigh, abduction, or rotation—nothing but the simplest and gentlest manipulation of the part, and a careful measurement; and, moreover, no such blunder as that of mistaking a contused hip for a fractured one, ought to be possible. For, gentlemen, such a blunder is possible, and has been made. Indeed, not many months ago an old man, aged sixty-six, who had fallen on his trochanter, was sent into this hospital as the subject of a fracture of the neck of the thigh-bone, and he had many of the symptoms associated with such an injury; but my dressers, on examination, finding that no shortening of the test-line *o b* was present, concluded that such a diagnosis was wrong. And in that opinion they were quite correct, for I found the case was one of contusion only, and the man soon walked out of the hospital well.

Let me ask you then, gentlemen, not to throw aside the plan I have brought before you untried; use it and do not abuse it, for what has been found of value by those who have preceded you as dressers in this institution, as well as elsewhere, will doubtless be of value to you, as I feel confident it will to many who come after you.

#### ABSTRACT

OF A

### Clinical Lecture

ON THE

#### DIAGNOSIS OF CERTAIN SKIN ERUPTIONS.

*Delivered at the Queen's Hospital, Birmingham,*

By EDWARD MACKEY, M.D. Lond., M.R.C.P.,

Physician to the Hospital, and to the Children's Hospital.

#### VARIOLOUS ERUPTIONS.

AFTER having spoken of the importance of the subject of diagnosis, more especially since special public wards have been opened for cases of small-pox and fever, and, after having detailed the recog-

nised diagnostics of ordinary cases, I proceed to ask your attention to certain unusual forms of eruption; they will not be new to the well-experienced, but they are of sufficient practical importance to deserve fresh illustration.

1. *Variola hæmorrhagica* occurs under several aspects. Blood may be effused in small petechial spots shortly before, or at the time of, the eruption of papules, as in a lad, an out-patient, in whom we found next day the characteristic vesicles of small-pox, many of them filled with blood, especially about the legs. Or, again, blood may not be effused till the stage of pustulation is reached, and then gradually. But there is a third form much more dangerous and more difficult to recognise; you could not, indeed, know it as variolous unless prepared for its appearance. It is really a purpura, and has been well named purpura variolosa, the term hæmorrhagic variola being restricted to the forms above mentioned. This purpura we had an opportunity of seeing in the person of another out-patient, a man with similar history to the lad, and who showed us a deep purple coloration of his abdomen and upper thighs; it had occurred within a few hours, was persistent on pressure, with here and there a whitish papule, shotty to the feel. As we were obliged to send this case to the Small-pox Hospital, I will give you the details of another one longer under observation.

H. W.—, aged fifty, blacksmith, a hard drinker, on Monday, June 8th, felt ill in the evening; had headache and vomiting.—4th: Walked to his doctor's.—5th: Had much pain in back.—6th: A rash first seen.

On the 7th I saw him and noted "there is a dark-red sheet of color over the abdomen and upper thighs; it does not fade on pressure; there are a few round whitish spots, the size of a pea, slightly raised and hardish. The eruption is also in sheets of color over the lower limbs, with petechiæ between. The color is said to be less purple to-day than yesterday. There are patches of ecchymosed blood in the conjunctivæ. Patient is sensible but prostrate. Pulse 90; temperature 102° F.; respiration hurried; has diarrhœa. His back pain got better after poultices."

*History.*—It is learnt, on inquiry only, that there is variola in the house of his milkman, and at his favorite tavern: we know it to be epidemic. Whether patient be vaccinated or not is unknown. His attendant has told him he has measles. Patient says he has had measles twice, and like this. The prodromata, the position of the purpura, the shotty papules, and the condition of conjunctivæ led to the diagnosis of variola, but there was none of the usual eruption, and one could scarcely have called the case variolous but for the knowledge of its being epidemic.

June 8th.—Slept in the cold pack, and expressed himself as comfortable. The patches are darker purple; the papules more evidently shotty; conjunctivæ swollen and all blood-shot; urine contains blood; diarrhœa continues; is wandering at times. Pulse 90, feeble; temperature 101.6°. Five hours afterwards he died.

Of such terrible cases this is a typical history and termination. You may pass years without seeing one, but my friend, Mr. Bates, the medical officer of the Small-pox Hospital, informs me that during the last nine months there have been admitted 26 hæmorrhagic cases out of a total of 608.

2. The diagnosis of variola may be obscured by an *erythema* preceding it from one to three days; this has been called *roseola exanthematica*, better *erythema variolosum*.\* This may be (a) bright in color and simulating scarlatina, though really less general, less marked at flexures, often patchy, and more like a blush than punctate; (b) or it may be dusky, mottled with some petechiae and patches of color, and resemble measles or typhus; (c) it may be of deep color, and limited to the lower abdomen and thighs, much resembling the hemorrhagic or purpuric form, but fading on pressure. The following are instances of varieties (a) and (b); and it is worth while to note that the former occurs mostly in vaccinated persons, precedes only the *modified* form, and hence is not unfavorable; whereas the latter variety indicates, as a rule, the confluent malady.

(a) J. R.—, aged seventeen, shop-girl, vaccinated. For about three weeks had had malaise and shivering, no back pain, and it is not possible to fix the date of first constitutional symptoms, but on March 17th had vomiting and a "red rash" on the chest; continued at work. On the 21st, which might be reckoned the fifth day of the rash, when umbilicated vesicles might be expected, she was sent to the Queen's Hospital by a careful and experienced medical man as a case of scarlatina. There was a red macular rash over chest and arms, disappearing on pressure, not shotty; throat red, slightly painful; tongue furred with red papillae; slight headache and delirium. Pulse 120; temperature 103°.

You will observe that the rash was partial, was not on the face, nor most at flexures; moreover, on this fifth day, if scarlatina, the throat would have probably suffered more, the lower limbs would have shown some rash, and the upper limbs would have been partly desquamating. On the other hand, we had to consider the possibility of an irregular form of scarlatina, which it certainly much resembled.

On the 22nd the eruption was less red; some papules had appeared on the face in the course of the previous night. On the 23rd the papules became vesicles, and on the 24th characteristic small-pox pustules; there were a few others on the body and limbs. Patient transferred to the special hospital.

(b) A delicate lad, aged fourteen.—June 4th: Sickness; headache; rigors; no back pain.—5th: Very drowsy.—6th: Rash seen "in skin."—7th: First seen by me. A dusky macular rash, most over face, but a large patch on abdomen, several on legs, many petechiae on body and limbs; there are a few papules, larger, acuminate, whitish.—*General condition*: Dozing, not easily roused; sordes on teeth; many yellowish stools to-day; some catarrh; a few coarse râles, no marked dulness; temperature 104.6°.—*History*: Ailing for six months, with emaciation and cough; the mother knows little more, having been absent till

a few days ago. The lad has stated that fourteen days ago he saw a boy with small-pox (which is epidemic); it might have been measles.

Diagnosis could not be made with certainty. There was much resemblance to typhus, which we are accustomed to say we never see in Birmingham; the balance of opinion was towards measles, but the whitish papules should be noted as indications of variola, and the commencement on the third day instead of the fourth.

A warm sheet pack was ordered, and gave comfort. On the 8th there was a *bright-red* rash over body and limbs, papular in parts, but still resembling measles; temperature 102.6°. On the 10th, when next seen by me, the boy was covered with confluent pustules, not hemorrhagic. He was sent to the special hospital.

I have quoted cases of small-pox mistaken for measles and scarlatina, but the converse happens, perhaps, more often. Mr. Bates tells me that amongst the cases sent to his wards as small-pox, are "urticaria, pustular scabies, varicella, and the exanthemata in general."

With regard to varicella, a principal source of error is the finding of some vesicles umbilicated, and it is desirable to state more emphatically than is usual in English text-books, that this umbilication, though important, is not necessarily peculiar to, or diagnostic of, small-pox. It occurs in the croton-oil eruption in herpes sometimes, and when pus is formed in a hair-follicle or sweat-gland. I have known it to give rise to much difference of opinion as to a case of *acne*, and to require careful consideration before diagnosing a pustular syphilide on the face: the "varioliiform syphiloderm" of Dr. Tilbury Fox (pp. 286-9); the "acne-varicella syphilitica" of Neumann (Dr. Pullar's Trans., p. 266).

Now, varicella we constantly hold and teach to be a disease really different, and to be distinguished, from variola; but it is well you should know that this is denied by Hebra, Neumann, and others, and that what is called varicella by them really propagates variola, and answers apparently to our "modified" small-pox. (H. Fagge, Gee.)

Professor Thomas, of Leipzig, however, in a more recent essay (Ziemssen, vol. ii.), founded on a large experience, reasserts the specific difference between varicella and variola, and infers that now the majority of German physicians (clinical teachers) recognise it. He says further, on the question of diagnosis (p. 22), "*Eruptions resembling varicella* IN ADULTS, *always* indicate variola" (modified). This, I believe to be sound doctrine, and safe to act upon.

I have said that the vesicle of herpes is sometimes umbilicated. This you can verify daily in zoster, but there seems to be a variety sufficiently resembling small-pox to be entitled to the name of "Herpes varioliformis." It is only to such a form that I can refer the case recently in Ward 7.

Selina A—, aged thirty-two, was admitted to Ward 7 on Dec. 15th, being dangerously ill with mitral reflux, albuminuria, and anasarca. Pulse 114; temperature 100°. There was no eruption, except erythema læve on the legs.—Dec. 16th: A few papules on the right cheek and nose. No history of vomiting or other prodromata. No odor.—17th: The papules have become vesicles.—18th:

\* Mr. J. F. Marson speaks of the roseola as occurring "very often," and lasting two or three days. (Reynold's System, i., 231.) Hebra as "not uncommon," and lasting twelve to twenty-four hours. (Trans. H. Fagge, i., 56.) Curschmann (in the course of a very careful essay in Ziemssen's Cyclop., ii., 349), says:—"It is but recently that attention has been paid to certain initial (prodromal) rashes of very great interest and practical importance..... They occur with very dissimilar frequency in different epidemics. Thus, in 1870-71 there was abundant opportunity for their observation almost everywhere, while in most other epidemics during the present century they have appeared with comparative rarity." M. Simon is especially referred to as an early observer.

\* Dr. Frank Foster has published cases of "Herpes (contagiosus) varioliformis" in the American Archives of Dermatology, January, 1875.

The vesicles have become pustules, from the size of a pin's head to that of a pea; some umbilicated, one group of three, and one of five. There are small vesicles on the other cheek and eyelids; a few papules on each forearm, none elsewhere.

The question of her removal (if variolous) now arose; but Dr. Heslop, who kindly saw her, agreed with me that though the appearances quite resembled what may be seen in modified small-pox, yet the whole history of the case was against it, and removal was not necessary.

Dec. 22nd.—There have been two fresh crops on the sides of the face and forehead and near the left wrist, nowhere else.—26th: The eruption on the face has a depressed scab. No fresh appearances, except purpuric spots on the limbs, connected with general symptoms of venous stagnation.

When she died, about a week afterwards, there was no trace left of the eruption. I believe that it was allied to those forms of herpes which occur sometimes in pneumonias and fevers, though different enough to need a different name. There was no history or evidence of infection.

## Original Papers.

### ON GELSEMINUM SEMPERVIRENS.

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and

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(Continued from March Number, p. 130.)

IN our previous communication we described a semi-tetanic condition, produced by gelseminum, supervening after more or less marked loss of voluntary and reflex power. Whilst testing the effect of large doses of this drug on the heart, we produced well-marked tetanus, which led us to further investigate this condition. We have experimented on thirty-four frogs. We injected the solution under the skin of the back in the neighborhood of the posterior lymph heart. A third of a grain and upwards of the alkaloid prepared for us by Mr. Gerrard caused well-marked tetanus. These large doses quickly caused great loss of voluntary and reflex power, with arrest of respiration. When the paralysis became well developed, but generally before the abolition of reflex action, mechanical and electric stimulation induced slight tetanic twitches. These rapidly increasing in severity, the posterior extremities being most affected, and on irritation of any part of the body they became rigidly extended, the toes widely separated and spread out like a fan. The anterior limbs and the muscles of the trunk were generally less affected, though in one case during the paroxysm the body was bent and the lower jaw strongly drawn down. In a few seconds the paroxysm temporarily ceased, the animal becoming limp, and the tetanus could

not for some seconds be re-excited, as if the cord were exhausted and required a short pause to regain its energy. The severity of the tetanic convulsions varied and was not always in proportion to the dose, even when the same preparation was used. They were never so severe as the paroxysms produced by strychnia. When the tetanus was well marked, merely striking the table or stamping strongly on the floor would excite the paroxysm. After the rigidity had subsided, the legs generally remained extended, though flaccid, but in some instances they were strongly drawn up on the trunk. The convulsive movements generally began about three-quarters of an hour after a dose, but on one occasion they set in in seventeen minutes, and on two other occasions, after a dose only just adequate to produce a slight attack, the tetanus was delayed eight hours. The tetanic state lasted a very variable time, usually from two to three hours.

Strychnia tetanus differs strikingly from gelseminum tetanus in the following particulars:—1. Strychnia tetanus supervenes without previous loss of voluntary or reflex power. 2. Respiration continues unimpaired during the paroxysms. 3. Every part of the body is affected, the anterior extremities as strongly as the posterior. 4. The cord is much less rapidly exhausted; thus a fresh paroxysm could be excited directly the previous one had declined, and in this way it could be reproduced many times without any interval or apparent diminution of intensity. 5. Strychnia tetanus persists for many hours, or even for several days.

Gelseminum tetanus, on the other hand—1. Is always preceded by considerable loss of voluntary and reflex power. 2. Respiration ceases before the onset of the convulsions. 3. The posterior extremities are most affected. 4. Irritation fails to excite another paroxysm till the lapse of some seconds, as if the exhausted cord required time to renew its energy. 5. It lasts only a short time—sometimes only half an hour, rarely more than three hours.

We have to ascertain whether these tetanic convulsions are due to the action of the gelseminum on the brain, cord, motor nerves, or muscles. The character of the tetanic convulsions tend to show that they are due to the action of the drug on the cord. They are not due to an effect on the brain, for they took place in frogs after pithing and destruction of the brain. Nor are they due to an effect on the nerves or muscles, for they occurred in the posterior extremities after tying the abdominal aorta; they must, therefore, depend on the action of the gelseminum on the spinal cord.

We wish to draw particular attention to the curious fact already mentioned, that the tetanus is always preceded by considerable loss of voluntary and reflex power, a loss in some cases nearly complete. Respiration had almost, and in some cases quite, ceased before the onset of the paroxysms. Is this strange effect—namely, paralysis followed by tetanus—produced by the same substance, or does the plant contain two active principles having opposite properties? Or is part of the alkaloid chemically and thereby physiologically altered during the process of extraction? We do not think that this unusual antagonistic action is due to a chemical alteration of part of the alkaloid, for though we elicited these tetanic convulsions most markedly after the alkaloid, yet we noticed that in certain instances the liquid extract induced slight quiverings, and in others well-marked tetanoid

movements, in some cases almost as marked as when we employed large doses of the alkaloid. It occurred to us that in preparing the alkaloid by means of ether an ethyl compound might be formed, and that through this substitution the properties of part of the alkaloid might be reversed; but Mr. Gerrard prepared us an alkaloid extracted by means of chloroform, and this we found produced tetanus as marked as that following the use of the alkaloid prepared by ether.

Does the plant contain a single active principle which first paralyzes and then tetanizes; or does it contain two agents, one capable of paralyzing, the other of exciting, the cord? This question must be answered through the investigations of pharmacologists. Our observations, however, incline us to the view that the plant contains two active principles. For it is difficult to imagine how a substance can first paralyze and then excite an organ. But if it should be held that gelseminum contains only one active constituent, then we may point out that whether we get paralysis alone or paralysis followed by tetanus depends on the dose. With small doses of the alkaloid we get only paralysis; with rather larger, quiverings and tetanoid movements; and only after large, decided tetanus—for, as a rule, tetanus occurred only after the use of one-third or one-half of a grain of the alkaloid, though on one occasion well-marked tetanus followed the use of one-seventh of a grain, and, on the other hand, on one occasion only slight convulsions followed the injection of two-thirds of a grain.

If the plant contains two active ingredients they must both be present in the liquid extract and in the alkaloid prepared for us by Mr. Gerrard, for both these preparations produce paralysis and tetanus, though we shall show their action is not identical. After the liquid extract paralysis is most marked, but after the alkaloid tetanus is more developed; as if during the preparation of the alkaloid some of the paralyzing principle was left behind; and hence after the liquid extract paralysis predominates, whilst after sufficient doses of the alkaloid tetanus is well-marked. These views are supported, we think, by the following experiments. We prepared a watery solution of the alkaloid, of the same strength as the liquid extract. Mr. Gerrard extracts from the root by his method only  $\frac{1}{4}$  per cent. of the alkaloid, but he thinks some of it is lost, and we therefore assumed that the root contains  $\frac{1}{2}$  per cent. The liquid extract is made with equal parts of the root and water, so that in effect one hundred minims of extract is equivalent to one hundred grains of root. We therefore dissolved half a grain of the alkaloid in one hundred minims of water. We then compared the effects of each solution on two series of frogs, four to each comparative experiment, using respectively five, ten, fifteen, and twenty minims of each preparation. The paralyzing power of the liquid extract was found to be much greater than that of the alkaloid solution; twenty minims indeed of the alkaloid solution producing a degree of paralysis equal only to that following the injection of two or three minims of the liquid extract. These comparative experiments show that Mr. Gerrard's processes only partially extract the paralyzing principle. We have thus contrasted the paralyzing property of these two solutions, but the quantities were too small to enable us to contrast the tetanizing effects. We had found that one-third of a

grain and upwards of the alkaloid generally produced marked tetanus. We then injected three frogs, each with fifty minims of the liquid extract, and produced rapid paralysis, but no tetanus. Now a corresponding dose of the alkaloid would have produced tetanus, therefore if the plant contains only one active ingredient we should have expected the liquid extract to have excited tetanus.

To recapitulate, then, somewhat. The foregoing experiments seem to be explicable in this way:—The plant contains two active ingredients; and in Mr. Gerrard's preparation of the alkaloid the tetanizing agent exists in larger proportion, whilst the paralyzing agent predominates in the liquid extract. The tetanizing agent produces its effects rather more tardily than the paralyzing agent. Thus in employing the same quantity of each preparation, of identical strength, a small dose of the alkaloid will exert less paralyzing effect than the equivalent dose of liquid extract, whilst with a large dose of the alkaloid the tetanizing principle is able to overcome the depression of the cord produced by the paralyzing principle; but as the action of the tetanizing agent comes on later, we get first paralysis, and then tetanus. On the other hand, in using the liquid extract, where the paralyzing agent is in excess of the tetanizing ingredient, small doses paralyze more completely than the corresponding quantity of the alkaloid solution; whilst large doses of the liquid extract, like fifty minims, produce paralysis so profound that the tetanizing ingredient fails to produce its characteristic effect. It is right to say that of the fifty minims of the liquid extract we injected under the skin a considerable quantity remained unabsorbed (as we ascertained by post-mortem examination), paralysis of the cord and heart coming on so soon that absorption was prevented. It may be said, therefore, that had larger doses been absorbed, the tetanizing agent would have shown its effects. But, on the other hand, we think that these experiments tell strongly against the hypothesis that one alkaloid produces these opposite effects. Though a large quantity of the liquid extract remained unabsorbed, yet, as enough was taken up to produce rapid and profound paralysis, there was enough surely to excite tetanus.

Further, we are bound to mention that in the experiments with fifty minims of the liquid extract the fluid pushed its way under the skin, and bathed the muscles of the extremities, so as to impair their irritability. It might be suggested that this incident prevented the development of the tetanic effect on the cord; but this diminution of muscular irritability came on after the period for the onset of tetanus had passed; moreover, in two of the three observations a good deal of muscular irritability remained to the end of the experiment.

If there are two alkaloids, what is their nature? Dr. Fraser has shown that tetanizing agents, like strychnia, brucia, and thebaia, by the substitution of the radicle ethyl or methyl in place of an atom of hydrogen, undergo a change in their physiological action, and produce general paralysis. Perhaps it may be said that these new substitution compounds have been produced only by chemists, and do not exist in nature. But ethyl and methyl compounds are met with in natural products, though these possess no tetanizing properties. Thus in *succus conii* we have two compounds existing often in varying proportion—namely, conia and



methyl-conia. Does the tetanising principle of gelseminum exist in part naturally as an ethyl or methyl compound, and, like strychnia, become changed by this conversion into a paralyzing agent, so that gelseminum contains both a tetanising and paralyzing alkaloid, the last preponderating? We may point out that, whilst strychnia, brucia, and thebaia excite tetanus by their action on the cord, their ethyl and methyl compounds paralyse by their action chiefly on the motor nerves, and in a less degree on the cord; but we have seen that both the paralyzing and tetanising principles in gelseminum affect the cord only.

We next performed a few experiments to test the antagonism between gelseminum and strychnia. As gelseminum so profoundly depresses the functions of the spinal cord, we thought that it would prevent or arrest the tetanic convulsions produced by strychnia, and our conjecture proved correct. To one of four frogs we administered 1-240 of a grain of strychnia, injecting it under the skin of the back near the lymph heart, and in four minutes exalted reflex irritability set in. In fourteen minutes distinct tetanic spasms occurred, though voluntary power was not impaired, but when the animal jumped, its movements were awkward, as if the limbs had not free play, and occasionally there occurred a distinct paroxysm, the legs being rigidly extended, with the toes spread out like a fan. More generally, on irritating the animal, he became fixed in his position, and the contraction of the chest muscles forced out a muffled croak. In thirty-five minutes well-marked tetanus set in, the slightest irritation causing contraction of every muscle, the posterior legs being rigidly extended and the anterior extremities flexed across the body. The breathing was hurried and deep. To another frog we gave 1-400 of a grain of strychnia, and it produced the same symptoms. When tetanus was fully developed, we injected under the skin of the back fifteen minims of the liquid extract of gelseminum, and in fifteen minutes, when well under the influence of the last drug, the spasms were much contracted, the frog became limp, and respiration had ceased—in very much the same state as if under the influence of the injection of large doses of gelseminum alkaloid. For instance, the convulsions were less readily excited, less marked, soon ceased, and some seconds elapsed after a paroxysm before another could be excited. In twenty-five minutes the tetanus had become reduced to mere quivering like that produced by gelseminum alone; in two hours and three-quarters even this quivering had ceased.

We next injected two frogs each with 1-240 gr. of strychnia, and immediately after with fifteen minims of the liquid extract of gelseminum. In a few minutes slight paralysis was noticed—i.e., the animals no longer assumed their usual semi-erect posture, but squatted on their bellies. In twenty minutes distinct tetanus set in, and respiration was abolished; in thirty-five minutes the tetanic convulsions were shorter and less easily excited; in an hour and a half only quivering remained, and the animal was quite limp; and in three hours and ten minutes the quivering had ceased.

These experiments illustrate the antagonism between strychnia and gelseminum, for strychnia convulsions last two or three days, whilst gelseminum suppresses them in from twenty-five minutes to an hour and a half, if the quivering is

excluded from the calculation. As the combined influence of strychnia and gelseminum produces a condition exactly like that caused by gelseminum alone—that is, a combination of paralysis and tetanus,—we think that these observations tend to further support the view that gelseminum contains two active agents; that the paralyzing prevents the tetanising principle from displaying its full energy, and, in the same way, that it lessens the convulsions from strychnia.

#### THE INFLUENCE OF GELSEMINUM ON THE FROG'S HEART.

With the view of investigating the influence of gelseminum on the heart, and of comparing its action with that of other drugs the effects of which on the circulation are already known, we made a number of observations on frogs. In the first place, we watched the action of the drug on the heart *in situ*. In some of our experiments we, before opening the thorax, divided the medulla oblongata by cutting through the occipito-atlantal membrane, and then destroyed the encephalon by thrusting a small piece of wood through the foramen ovale into the cranial cavity. This method of destroying sensibility is attended with but little loss of blood, but is not free from disadvantages. It cuts off the influence of the pneumogastric nerve, and to some extent, if not entirely, of the vasomotor centre, dilating the arteries in the parts below the point of section, decreasing the blood-pressure, and in this manner exerting a considerable effect on the condition of the heart. In other experiments sensibility was destroyed in a different way. An incision was made through the integument of the skull, extending from the base of the nose in front to a transverse line just anterior to the membrana tympani behind. A disc of bone was then removed with a small trephine, and the brain destroyed by the introduction of the actual cautery into the cranial cavity. By this procedure the medulla was left intact, whilst hæmorrhage was effectually prevented by the cauterisation. Again, in a third set of experiments the drug was first administered, and as soon as voluntary power and reflex action were abolished the thorax was opened and the state of the heart observed.

Before proceeding to speak in detail of our experiments we may perhaps be allowed a word or two as to our general method of procedure, and as to the time and frequency of our observations. Every frog engrossed the attention of one or both of us for several consecutive hours. We usually commenced our work at an early hour in the morning, and remained in the laboratory until four or five in the afternoon, often paying one or more visits in the course of the evening. The animals were usually kept under surveillance for many days, or until the abolition of all vital action, care being taken to prevent them from desiccating by the frequent application of saline solution. In cases in which we compare the action of gelseminum with that of other cardiac poisons, such as digitaline and aconitine, the difference or similarity was actually observed. In every instance in which such a measure was admissible, or even possible, we standardised our frogs—i. e., we placed them side by side with an unpoisoned frog which had been subjected to exactly similar operative procedures, or to which the drug had been administered, with which we compared the action of gelseminum.



The influence of gelseminum on the heart varies considerably with the dose given, the effects produced by a large injection being very different from those which follow administration of a small or medium dose. In the first place we will speak of the influence of ordinary doses on the circulation, of which the following may be taken as a fair example.

A large German frog, having been previously weighed, was trephined in the manner already described, the cranium being eviscerated by means of the actual cautery. There was no loss of blood externally. In a few seconds the animal had recovered from the shock of the operation, and, reflex action being perfect, it was pinned out on a flat piece of cork. The thorax was then opened by cutting through the sternum, especial care being taken in this procedure to avoid injuring the abdominal vein and other vessels. The heart was then seen beating through the pericardium, which was not opened, so that the viscus was not exposed to the air. The characters of the heart's action were carefully noted, and the number of its beats was counted at short intervals. Its rate having been thus determined, the long canula of the hypodermic syringe was passed beneath the skin downwards to the neighborhood of the posterior lymph hearts, where ten minims of the liquid extract of gelseminum was injected. At the moment of injection the heart for a few seconds ceased beating. This momentary arrest of the heart's action occurred in several frogs to which gelseminum was administered in the same way; but as the result was not constant, and as it followed the administration almost instantaneously, we concluded that it resulted from the shock of the injection, and not from any action of the drug. In a few minutes the heart was found to be beating more slowly, and in a quarter of an hour its rate of pulsation had been reduced from 68 to 48 beats in the minute. Neither in this nor in any other case was any initial quickening observed. A few minutes later a change was noticed in the character of the heart's action—a change which ensued slowly and gradually. There was no irregularity either with regard to time or the mode or relative order of contraction of the cavities of the heart, but the range of the heart's action had been distinctly lessened. The ventricle was contracting well and firmly, but it was in a state of almost constant contraction or semi-contraction, there being very little dilatation. The heart was acting badly, not because it was unable to contract, but because it dilated so feebly that little blood entered its cavities, and there was consequently little for it to expel. At this time there had been some impairment of reflex power, but it was far from being abolished. A few hours later, when reflex and voluntary power had quite ceased, the range of cardiac action was found to have been still further reduced, and the number of pulsations of the ventricle in the minute had fallen to four. At this time the auricles were beating more frequently than the ventricle, there being usually two pulsations of each of the former to one of the latter. At the expiration of twelve hours the heart had ceased beating; it had stopped in systole. The ventricle was strongly contracted, being small, hard, and perfectly white. The auricles were flaccid and soft, but were not distended with blood. The general condition of the heart was exactly the reverse of that produced by a moderate

dose of aconitja. On irritating the ventricle the auricles recommenced beating, and after a few minutes a little feeble action was perceptible in the ventricle, the number of pulsations, however, being not more than three or four in the minute. This continued for about an hour, when the heart was again arrested in systole. This resumption of the heart's action on irritating the ventricle was frequently noticed in these gelseminum hearts, it sometimes occurring several times. The heart continued to contract long after respiration had been completely abolished.

This pale contracted heart was found in nineteen frogs to which we administered small doses of gelseminum. It was readily and uniformly produced by the subcutaneous injection of from two to fifteen minims of the liquid extract of gelseminum, and by doses of the solution of Mr. Gerrard's preparation of the chloride of gelsemin, corresponding to from one-twentieth to one-fourth of a grain of the alkaloid. The exhibition of larger quantities of the drug was usually followed by the production of other conditions, to be presently described.

To return, however, to our experiments. Were the effects we have witnessed actually due to the injection of the drug? In the first place, as regards the slowing. What proof, it may be asked, can we adduce that the retardation of the cardiac action was actually caused by the gelseminum and was not due to exposure to the air or other extraneous cause? As already stated, we standardised our frogs. Side by side with our gelseminum frog was placed another frog, the brain of which had been destroyed and the chest opened, so as to expose the heart. The cardiac pulsations in this frog were counted hourly for twelve hours; and during that time there was but little variation, and no ultimate retardation in their frequency. Moreover, some months ago, whilst investigating the action of jaborandine on the heart, we opened the thorax and pericardium of a normal frog, and took the rate of the heart's pulsations every quarter of an hour from 10.15 A.M. to 4.30 P.M. In that case there was no diminution in rapidity, the last observation differing by only two beats in the minute from that of the first. Our experiments may then, we consider, be regarded as affording a conclusive proof that gelseminum slows the heart.

We proceed next to consider in detail the peculiar pale contracted character of the heart in these frogs. Was this caused by the drug? Such a condition, it may be argued, might possibly have arisen from the hæmorrhage attendant on the operation, the heart accomodating itself to the amount of blood contained in its cavities. What proof have we that such is not the case? We performed the following experiment. We pithed a frog, and then opened the thorax, purposely cutting all the vessels with which we came in contact, and also divided one of the femoral arteries. The loss of blood was in this case much greater than in any of our gelseminum frogs. There was no decrease in the frequency of the cardiac pulsations, and the heart, although it ceased beating in systole and was quite pale, was very much less firmly contracted than the majority of gelseminum hearts. A further, and if possible a more conclusive, proof is afforded by the fact that the typical small gelseminum heart was frequently observed in cases in which there had been no loss of blood, the thorax not having been opened until the drug had caused

complete arrest of the circulation. That the condition of the heart was not due to destruction of the brain is proved by its frequent occurrence in animals which had not been pithed. It may, therefore, be concluded that gelseminum, in moderate doses, produces a small, white, contracted heart.

We now pass on to the consideration of the effects produced by a very large, we may say an overwhelming, dose of the drug. A frog weighing thirty-one grammes having been trephined, and the brain destroyed by the cautery, the thorax was laid open so as to expose the heart. It was found to be beating regularly, about 40 in the minute. A large dose of the solution of the alkaloid ( $= \frac{1}{2}$  gr.) was then injected in the neighborhood of the posterior lymph hearts. In twelve minutes the number of pulsations in the minute had been reduced by nearly one-half, and the ventricle was found to have increased in size, and to have assumed a darker color. The ventricular contractions had lost much of their power, and appeared to be incapable of expelling more than a small portion of the blood with which the cavities of the heart were distended. A few minutes later a little irregularity in the heart's action attracted attention, the irregularity consisting chiefly of pouching at the apex. This disordered action was less distinct and more transient than in cases of poisoning by digitaline. The heart gradually assumed a deeper and deeper color, the diastole was very greatly prolonged, and even in its imperfect systole the ventricle never lost its deep modena tint. Its appearance differed strikingly from that of the pale, contracted heart described as resulting from a small dose of gelseminum, but presented a very close resemblance to that produced by the injection of one-fifteenth of a grain of aconitia. These cardiac changes commenced before the tetanic symptoms made their appearance, and even before there was any impairment of reflex power. The heart continued to contract feebly for nearly twenty-four hours, its rate of pulsation gradually decreasing in frequency till it was finally arrested. Post mortem the heart was the prominent feature of the thorax. It was distended, soft, and flabby, and of a color closely resembling that of the liver, for which at first sight it might readily have been mistaken.

The large gelseminum heart was obtained by us in twenty frogs, in some of which the brain had not been destroyed, and was uniformly produced by doses of the liquid extract exceeding twenty-five minims, and by doses of the alkaloid exceeding half a grain.

We have now to speak of the effects on the circulation produced by moderate doses of the drug—by, let us say, twenty minims of the liquid extract, or by one-third of a grain of the alkaloid. By the injection of a frog with these quantities sometimes the contracted heart was produced and sometimes the dilated. How can we account for the production by the same dose of medicine of such different effects in different animals? Why should we sometimes obtain the small dose heart and sometimes the large? Could the disparity have resulted from the escape of any of the fluid after its injection? Certainly not; we took especial care to avoid this possible source of fallacy. In the first place, the canula of our hypodermic syringe was extremely fine, and made an opening not larger than a pin-hole; in the second place, the aperture was made at some distance from the

point of injection; and, finally, when large quantities of fluid were used, the frog was held vertically in the folds of a cloth until some of it had been absorbed. Could the difference have arisen from the non-absorption of some of the fluid? Possibly to a slight extent. We can inject the drug under the skin, but cannot ensure its absorption—that is a point which rests entirely on the frog. We imagine, however, that the differences to which we have referred have their origin chiefly, if not wholly, in the varying size of the frogs. With the view of investigating this point, we weighed sixty frogs, either during life or soon after death, and found that their weight varied from eight to fifty-eight grammes. This variation in the size of the animals was clearly the source of our difficulty, and the discrepancy in our results was consequently more apparent than real. This was confirmed by reference to the individual experiments to which we had appended the weights of the frogs.

Granted, then, that the same dose of the drug always, in frogs of the same weight, produces the same condition of heart, what have we to say respecting the great differences observed in the hearts resulting from small and large doses? Why should a small dose of gelseminum produce a small contracted heart, and a large dose a large dilated heart? We have no explanation of these phenomena to offer, but may point out that the ultimate effect on the circulation is in both cases the same. Stasis in the vessels is produced equally by heart which is so firmly contracted that no blood can enter its cavities, and by a heart which is so gorged with blood that it cannot expel its contents.

(To be continued.)

## CLINICAL ESSAYS.

By T. PRIDGIN TRALE, M.A., F.R.C.S.,

Surgeon to the General Infirmary at Leeds.

### NO. VI.—ON THE TREATMENT OF VESICAL IRRITABILITY AND INCONTINENCE OF URINE IN THE FEMALE BY DILATATION OF THE NECK OF THE BLADDER.

(Continued from February Number, p. 60.)

In continuation of my paper on this subject, the following cases are brought forward to show the kind of success that has been obtained in a very obstinate disorder. For many of them I am indebted to my medical friends. The notes of some of my own cases are, I regret to say, very imperfect, but they express the main facts. The instances which I shall first relate will be those in which the operation has been clearly successful, being anxious, first of all, to prove what the operation is capable of doing. At a future time I hope to publish some of the less successful cases, as a caution to those who may adopt the operation not to be too sanguine of success in every case.

**CASE 1.** *Dilatation of urethra as a means of exploration of an irritable bladder; relief of symptoms.*—This case occurred prior to our removal to our new hospital—i. e., before the summer of 1869,—I believe in 1867 or 1868. A patient suffered from vesical irritability and passed bloody mucus in the urine. Failing to detect a

stone, I dilated the urethra that I might search for a polypus, villous growth, or ulcer. The finger detected nothing of the kind, but the operation relieved her symptoms, so that she was able in a short time to leave the hospital. As no record was taken of the case, I am unable to find her address and inquire into her further history.

**CASE 2. Vesical irritability of three years' duration; cured by dilatation.**—Mrs. P—, of Morley, had suffered from pain in the bladder and too great frequency in micturition for three years. For the last year vesical pain had been extremely distressing, micturition occurring every hour, often many times in the hour.

Feb. 10th, 1871.—Dilatation of the urethra and neck of the bladder.

During the following twenty-four hours she suffered from very severe pain, probably from laceration of the urethra during the operation.

Feb. 18th.—Passed urine twice only during the night.

March 8th.—Is better than she has been for two years. Has very little pain. Retains her urine for two hours.

April 27th.—Hardly any pain. Is disturbed only twice each night, instead of six or seven times.

Feb. 4th, 1873.—She reports: "I think I am quite well." Sometimes she has a little pain at her menstrual periods, and often passes a whole night without having to relieve the bladder. This patient attributed her ailment to prolonged sitting at her work as a bonnet-maker. There was no disease of uterus. The urine was healthy, and the finger failed to detect any disease in the bladder.

**CASE 3. Excessive frequency in micturition cured (?) by dilatation.**—This case is open to question because at the time when I dilated the urethra I also stretched the sphincter ani. Further I have not been able to ascertain her condition beyond two weeks after the operation. The case, however, is recorded as an instance of the vesical affection in childhood.

F. T—, of Batley, aged twelve, had suffered for six months from too great frequency in micturition, being compelled to relieve the bladder four or five times an hour, sometimes seven or eight times in the hour. In addition, she had quite recently suffered pain in relieving the bowel. The urine was healthy.

Feb. 8th, 1871.—She was put under the influence of chloroform. Having sounded the bladder and not detected a stone, I then dilated the urethra and the neck of the bladder—at first with the finger, and then to a greater extent with the "probe gorget." On the same occasion I dilated the sphincter ani.

During the following week the frequency of micturition ranged from five to eight times in twenty-four hours, instead of five or six times per hour.

Feb. 21st.—Passes urine only three or four times a day.

**CASE 4. Vesical irritability of seven years' duration; cure by dilatation.**—On Dec. 8th, 1873, Mr. Ellis, of Shipley, requested me to see Miss H—, who had suffered more or less for seven years from irritability of the bladder. She attributed the disorder to having caught cold during menstruation. She had complained of pain and too great frequency of micturition by day and by night, having to relieve the bladder about every

hour by day and four times at least, and occasionally eight or ten times, at night. She has at times passed pus, and once, five years ago, blood in the urine.

Being satisfied that all likely remedies had been tried, with the aid of Mr. Ellis I put her under the influence of chloroform and dilated the urethra.

A year after, January, 1875, in reply to my inquiry as to the result, Mr. Ellis writes: "you may place Miss H. on your list of cures; she is perfectly well."

**CASE 5. Painful micturition of six months' duration; cure by dilatation by Mr. Scattergood, Leeds.**—C. W—, aged fifty-one, for more than six months had suffered from very severe pain after each time of passing urine. Urine natural; no stone; no vascular tumour of urethra.

April 17th, 1871.—Mr. Scattergood dilated the urethra and neck of the bladder, until the urethra would admit the forefinger.

After the operation she had hardly any pain at any time, but partial incontinence of urine for a few days.

May 26th.—Reported well.

July 26th.—Sends word to the nurse that she continues well.

**CASE 6. Irritability of bladder of twelve months' duration; cured by dilatation by Mr. Horsfall, of Leeds.**—Amelia C—, aged thirty-eight, had been under various medical men for irritability of the bladder, and had taken all likely remedies. She had been constantly under treatment for nine months, and had suffered one year. She complained of great pain in micturition, and was disturbed seven or eight times every night.

Mr. Horsfall dilated the urethra with Weiss's dilator, so that the forefinger could be introduced. On the night of operation she passed urine once only, and the following night was not once disturbed—an event which had not occurred for twelve months.

Eight months afterwards there had been no relapse; she looked well, and had gained flesh; before the operation she looked haggard and worn.

**CASE 7. Incontinence of urine; apparently cured by dilatation by Mr. Horsfall, of Leeds.** A dispensary patient had suffered from incontinence of urine for three months. "She generally passed her urine into the bed on waking in the morning."

After the usual means of treatment had been tried in vain, Mr. Horsfall stretched the urethra and neck of the bladder by Weiss's dilator. A week afterwards she reported that she had had no return of the incontinence. The pain ceased in twenty-four hours after the operation. She has not been heard of since. No notes were taken at the time, and the patient could not be traced. This short record is given me from memory by Mr. Horsfall, who, I believe, suggested to me the adoption of the operation in cases of incontinence of urine.

**CASE 8. Irritability of bladder of three years' duration; cured by dilatation by Mr. Seaton, of Leeds.**—Ann N—, aged forty, a domestic servant, had lived many years in New York, and had enjoyed good health until the year 1869, when she first began to suffer from a frequent desire to pass water and from great pain in doing so. She consulted several medical men, but obtained no relief to her sufferings. As her health was giving way, she decided, about April, 1871, to come over

to England and visit her friends. At first after her arrival she thought that the rest had done her good, but she soon found her old symptoms return with greater severity than before.

Mr. Seaton first saw her in April, 1872. She was then emaciated, and had an unhealthy sallow complexion. She described her sufferings, from the frequent desire to pass urine and consequent straining, as being constant and severe, but much aggravated at night. On several occasions she had passed a considerable quantity of blood. Mr. Seaton found the uterus healthy and in its normal position, no calculus in the bladder, and the urine transparent and free from mucus and albumen. He tried a variety of remedies, but nothing gave relief but opium, and this relief was but temporary. As she became worse rather than better, Mr. Seaton took her into the infirmary, in order that he might dilate the urethra in the manner recommended by Mr. Teale. The operation was performed on July 15th, 1872, with Weiss's instrument, and was followed by incontinence of urine, which passed off in a few days. She left the infirmary a week after the operation, and at the end of a fortnight reported that she was able to sleep all night without being disturbed, and that she was completely relieved of the constant desire to pass water.

In October she called on Mr. Seaton to say that she was quite well, and that she was leaving for New York on the following day.

**CASE 9. Vesical irritability and vaginismus, of eleven years' duration; cured by dilatation by Mr. A. W. Robson, Leeds.**—Mr. Robson has kindly sent me the notes of the following case, which I give in his own words.

"I was called in to see Mrs. W—, aged thirty-seven, for another ailment, when I accidentally discovered that she was suffering from urinary symptoms. On asking her why she had not told me at first, she said she had thought that it would be useless, as she had been treated by several medical men in various ways, and at last had been told that nothing more could be done for her. She said that since she had craniotomy performed on her eleven years previously, her life had been one of constant misery, as she suffered from intense spasms of the vagina, which prevented coitus, and from a constant desire to pass water, never being able to retain it more than an hour, except at night, when she could hold it a little longer. I urged the necessity of an examination, which was granted. I found the vagina spasmodically contracted, so that the index-finger was introduced with great difficulty, causing great pain; the uterus normal; and the bladder apparently normal, as revealed by the sound. The urethral orifice was very prominent, the lips being thickened, forming an open ring. I advised dilatation, and, under chloroform, inserted Weiss's dilator, and dilated to the size of a half-crown, keeping the instrument in for about four minutes. After its withdrawal I easily passed the index-finger into the bladder.

"For the first few days after the operation the urine dribbled away, and after that she began to retain it, so that in a fortnight she could hold it for about two hours. She then went to the seaside for a month; and on returning, reported herself quite well. She had gained flesh, was in good spirits, was relieved of her vaginismus, and could retain her water several hours. I have since seen

her, and she said that she had never been in better health than she then was. "A. W. Robson.

"Oct. 27th, 1875."

**CASE 10. Vesical Irritability cured by dilatation; under the care of Mr. Edward Atkinson and Mr. John Halliday, of Leeds.**—Mr. Atkinson has obliged me with the following note, in which this case is related by Mr. Halliday.

"My dear Sir,—Mrs. R— was confined about Christmas, 1873. There was no difficulty about the labour, and for a fortnight after she did quite well. She then began to complain of piles (which she had had before), and also of a frequent desire to pass her water, with considerable pain in doing so. Several medicines and applications were tried for some weeks, with little or no relief. She then said she would try without medicine. I believe she did so for a short time, and then applied to you. You gave the opinion that the irritation of the bladder was dependent on the hæmorrhoids, and recommended their removal. This was not done, and she grew worse, became emaciated, and was evidently breaking down under her sufferings. You then saw her with me, and proposed to try dilatation of the urethra. This you did. She obtained some mitigation of her symptoms at once, and from that time slowly improved. The hæmorrhoids disappeared as her general health improved, and she is now in good health.—Yours, &c.,

"E. Atkinson, Esq."

"JOHN HALLIDAY."

**CASE 11. Severe vesical irritability of many years' duration, relieved by dilatation by Mr. C. S. Smith, of Halifax.**—The following is Mr. Smith's account of this case:—

"On Oct. 31st, 1874, I was consulted by Mrs. H—, who was suffering from hæmaturia and great irritability of the bladder. The urine contained clots of blood, and was passed in small quantities at a time and very frequently, always with pain and straining. She was pregnant. The irritability of the bladder was of several years' duration, but the bleeding had mostly come on within the last year and a half. She had been under all sorts of treatment. On examination per vaginam, there was found a tender spot on pressing against the bladder just to the right of the median line, and on introducing a catheter there was pain on turning the point in that direction, and blood followed its withdrawal. She was ordered small doses of morphia, which gave considerable relief to the pain, but not much to the frequency of micturition.

"On Jan. 3rd, 1875, she was confined of a healthy child.

"April 14th, 1875.—No improvement had followed her confinement. There was occasional bleeding. She had to pass water every ten minutes, day and night, with pain and straining. If she tried to delay emptying the bladder, the pain was intense. She was emaciated and exhausted by suffering and want of sleep.

"**Operation.**—Mr. Jukes gave chloroform, and I dilated the urethra, so that I could introduce the finger freely into the bladder, which was very contracted, hardly being of the size of a walnut. Just at the point which had been noted as being painful in the previous examinations a slightly raised hard patch was felt (an ulcer?), but there was no stone nor polypus. The immediate result of the operation was that the urine dribbled away. Every two or three hours she tried to pass water, but this was

done without pain. She rapidly gained in strength. I hoped that by degrees the bladder would increase in capacity. This, however, has not been the case, and the dribbling still continues. She has, however, no pain, and is in good health, eating and sleeping well, and looking after her children."

Mr. Smith further remarks, in a note written on Oct. 25th, accompanying the foregoing report of this case:—"She has unfortunately not got on so well as I had hoped. At the time of the operation the bladder was very much contracted, and it appears not to have expanded since, and thus the patient is on the horns of a dilemma. Either she must allow the urine to dribble away or she must pass it frequently. This, of course, is a result we must be prepared for, if the operation is done in a case with a rigid contracted bladder. It must not, however, be thought that this patient has gained nothing by the operation. *She has lost all pain and spasm.* She can take her choice whether to empty the bladder or allow it to empty itself, which she could not do before. She can sleep at night, can go about and get exercise, and she is in very good health; whereas before she had to pass water with pain and straining every few minutes day and night, and was a wretched invalid. The disease which is at the root of the mischief is still going on. There is still tenderness and occasional bleeding from the bladder, especially on defecation when the bowels are confined, showing that disease of the bladder is still there. I cannot help thinking that the continued existence of irritability of the bladder must tend to produce the same sort of mischief in the kidney which we find in old cases of stone, where there is no real obstruction, but only a constantly contracted state of bladder, and therefore that by the conversion of the case into one of constant dribbling a great danger to life is removed.—C. S. SMITH."

(To be continued.)

#### ON THE TREATMENT OF ACUTE ORCHITIS BY PUNCTURE OF THE TESTIS.

By HENRY SMITH,

Surgeon to King's College Hospital.

In the year 1864 I brought before the profession, a method of treating acute orchitis, which in my simplicity I imagined to be original. This consisted in puncturing the body of the inflamed organ by a single incision, extending in depth to half or three-quarters of an inch. My friend, Dr. Bumstead of New York, very properly took me to task in his work on Venereal Diseases for assuming it to be original, and pointed out that Vidal de Cassis had already long before advocated a precisely similar mode of treatment, had adopted it "with impunity in four hundred cases, and claims for it preference to all other modes of treatment."

Since this period I suppose I must have performed this operation in more than one thousand cases, and with results which have satisfied me equally with the French surgeon. Hundreds of my pupils at King's College Hospital have witnessed this treatment, and thus the results have been pretty satisfactorily ascertained, and I think

I am correct in stating that the majority of these gentlemen have carried with them into their practice the conviction that this plan is the most speedy and efficient mode of treating this painful affection.

It is only in cases of the most acute form of the disease that I recommend this treatment, and in by far the majority of these instances I have found that the relief given to the pain in the testicle itself is very marked, and almost instantaneous; in fact, so much so that patients who come to the hospital in severe agony are enabled to walk out of the building comparatively free from pain, and in many instances joking about the treatment to which they have been subjected. I have had patients return to me for similar treatment to the other testis, after undergoing the operation on the one at some previous time, and than this there can be no better proof of their estimation of the relief which is produced by the puncture.

When questioned by pupils as to the *modus operandi* of the remedy, I have answered that the sudden relief from acute pain is due to the circumstance that the unyielding tunica albuginea is freely incised, and that the tension is thus taken off the compressed and swollen testis; in some instances there is more or less serum effused into the cavity of the tunica vaginalis, and the withdrawal of this greatly assists in giving relief, but in many instances there is hardly any effusion of serum. In most cases undoubtedly the loss of blood produced is an important factor in the rapid subsidence of pain, but in some cases so little bleeding is produced that the relief cannot be explained in this way. Vidal de Cassis explained the sudden relief by the compression being taken off the testis through division of the tunica albuginea. In the old-fashioned treatment which I was taught to adopt, large quantities of leeches and nauseating doses of antimony were the chief ingredients; yet nothing like the speedy and effectual relief from puncture was produced, and every now and then a violent attack of erysipelas would be brought about by the leeches. As a general rule the puncture is productive of so much relief to pain that no other treatment is required, except to support the part, and occasionally to use compression by strapping—a means well calculated to diminish the swelling, which is scarcely at all reduced by the puncture, and the persistence of which annoys the patient.

I have seen none of the bad results from puncture as have been portrayed by the fertile imaginations of alarmists, who were haunted in their dreams by visions of hernia testis, atrophy of the organ, and emasculation. I had once a case of a slight protrusion of the "tubuli seminiferi," well known to my pupils; but this occurred in a young strumous man who, on the day following the operation, received a severe blow on the scrotum.

I have not met with a case of atrophy of the testis, but I have seen two cases in private practice, in young healthy persons, where the testis was quite destroyed from the violent inflammation of the organ, and where the good old-fashioned plan of leeches, &c., was used; in all probability puncturing the testis in these cases would, by relieving the inflammation, have prevented the destruction of the organ.

On looking into Mr. Holmes's new work on Surgery, I find, at page 797, the following remarks in reference to the treatment of orchitis:—"I never saw any need for puncturing the testicle, nor have observed any relief from following the practice in

the very few cases in which I have seen it tried, nor can I see why it should relieve the pain." I must confess I was much astonished to read this statement when it was pointed out to me by one of my old assistants who had seen me practise this operation in a great number of instances; and it is difficult to reconcile it with that enunciated by Vidal de Cassis, and with the conclusions arrived at by myself after the experience of a thousand cases. Either the French surgeon or myself must have been grievously deceived if Mr. Holmes be correct in his observations, or the difference in our conclusions about a simple matter of fact, so capable of demonstration, must be accounted for in another way; and the only explanation I can conceive to be at all reasonable is that Mr. Holmes, in the very few cases in which he has "seen it tried," did not have the opportunity of witnessing the remedy applied in the cases for which it is adapted, or that the operation itself was not employed in the manner pointed out by Vidal and myself. It does not appear, too, that Mr. Holmes has actually practised the treatment himself with his own hands, but has merely "seen it tried" in "very few" cases. This, possibly, may be the reason for the great difference in the results noticed. Possibly, however, I may have been too much and easily pleased by the treatment especially advocated by myself, and have seen results with too favorable eyes, and thus have been led into error. With a view, therefore, to prevent this error, and to see how far independent observers agree with me, I have asked for the opinions of several independent witnesses—gentlemen who have held the post of house-surgeon at our hospital, and who have been of necessity closely associated with me in my practice. I have made inquiries of six of these gentlemen, all of whom have had numerous opportunities of seeing me practise the method in question, and have been enabled to watch the cases afterwards, and the result of their observations is as follows:—

Mr. Rose, formerly our house-surgeon, and now surgeon to the Royal Free Hospital, says: "I have been frequently in the habit of adopting your plan of treatment at the Royal Free Hospital, and the instant relief from pain and subsequent rapid subsidence of inflammation are the undoubted results of the operation."

Mr. Barrow, our present surgical registrar and former house-surgeon, says: "I have seen you perform your operation of puncturing the testicle in acute orchitis in a large number of cases, and in every instance a rapid subsidence of all acute symptoms has followed, so much so that the patient has returned in two days almost perfectly cured."

Mr. Andrew Duncan, formerly our house-surgeon, and now resident surgeon at the Stanhope-street Dispensary, writes: "I had the opportunity of seeing numerous patients weekly treated by puncture of the organ for acute orchitis; it affords immediate relief from pain, and also is the best plan of treatment in such cases."

Mr. Richardson Cross, our former house-surgeon, now resident surgeon at the St. Pancras Dispensary, writes: "The hospital out-patient does not usually come under treatment until symptoms so painful as to demand immediate relief have supervened. Such relief I have seen given most decidedly by puncture at your hands in many

cases, without the occurrence of any untoward result."

Mr. McGill, of Leeds, formerly our house-surgeon, writes, with reference to this one point, the relief from pain: "I feel sure that the relief which, in the majority of cases, is undoubtedly obtained, is due to the evacuation of fluid from the tunica vaginalis." This gentleman's testimony is the more valuable, inasmuch as he contents himself with simply drawing off the fluid from the tunica vaginalis, and does not agree with me in the necessity of puncturing the testicle itself. It will be interesting to see if Mr. McGill will adhere to this view after he has had the experience of more than a thousand cases.

Mr. Footner, our present house-surgeon, writes: "My experience of the results of puncture of the testicle in acute orchitis is, that it is eminently satisfactory if used in suitable cases. By suitable cases, I mean those in which the tension is very great, the pain intense, and in which inflammation exists to a high degree. The relief from acute pain is most marked and almost instantaneous."

Now, here we have half a dozen men, able and independent, who I know would not make a statement for the sake of pleasing me or anyone else, entirely agreeing on the one point about which I have sought information—viz., the relief of pain. These gentlemen, too, have each of them seen and watched a large number of these cases, and the results witnessed are exactly those testified to by Vidal de Cassis and myself. I must leave it to those who are interested in this matter to explain how it is that Mr. Holmes should have arrived at a totally different conclusion on a simple matter of fact, which can be demonstrated so readily. Mr. Holmes holds such a high position as a surgical writer that it is doubly incumbent on him, as well as upon other authorities equally eminent, not to hazard an opinion upon insufficient data respecting any point in surgical practice. In the present instance it is quite clear that either Mr. Holmes or Vidal de Cassis, with the six witnesses above quoted and myself, must be in error. In any court of justice where evidence is received, the weight of this evidence, admitting the witnesses to be truthful, would be strongly against Mr. Holmes, and I have no hesitation in saying that if he carefully inquires into this matter by personal experience, he will, in the next edition of his work, come to a different conclusion respecting the treatment of orchitis by puncture.

Wimpole-street.

## EXPERIMENTAL RESEARCHES ON THE PATHOLOGY OF PNEUMONIA.

By J. DRESCHFELD, M.D., &c.,

Lecturer on Pathology at Owens College, Manchester.

THE fact that rabbits die of acute catarrhal pneumonia after their vagi have been divided has been made use of by Friedländer\* to study the histogenesis of that disease. According to him, the process consists entirely in the emigration of

\* Untersuchungen über Lungenentzündung, &c. Berlin, 1873.

serum and white blood-corpuscles from the capillaries of the lung into the alveoli, the epithelium lining the alveoli so playing a mere passive part; he, indeed, did find the epithelial cells swell, become more granular, and contain two or more nuclei, but he believes this to be a mere passive change due to their imbibing serum, which leaves them again as soon as the lymphoid elements have filled the alveoli, when the epithelial cells shrink back again to their normal condition, or undergo fatty degeneration. Such a view seemed so opposed to the microscopic changes found in human lungs affected with acute pneumonia, both croupous and catarrhal, that an investigation of the question seemed to me not unimportant; and in the following I beg to give briefly the results of a series of experiments which differ materially in some important points from those obtained by Friedländer.

In a first series of experiments I followed Friedländer's plan. Rabbits were used, their vagi divided, and the animals themselves killed from four to ten hours after the operation. The lungs were inflated, hardened in chromic acid, and then examined; in some cases specimens were examined in the fresh state. The lungs from animals killed four hours after the operation already showed changes perceptible to the naked eye; the lung did not collapse on being removed from the body; the lower lobes were much redder than normal, and on section a good deal of blood flowed from the surface; whilst the smaller bronchi contained a quantity of frothy mucus.

Microscopically hardened sections showed the blood-vessels surrounding the alveoli widened and tortuous, and the alveoli themselves distended and completely filled with large cells, measuring 0.02 to 0.082 mm., finely granular, with a darker central zone, and nearly all containing more than one nucleus; some contained two nuclei; others three, one larger than the other two; and not a few cells contained four distinct nuclei, arranged in pairs. The nuclei themselves were round, finely granular, and possessed a well-formed, centrally situated, hyaline nucleolus. Besides these large cells the alveoli contained only a few red blood-corpuscles, a few lymphoid cells, and some pigment and granular matter. In some places, where by the process of preparation these large cells had become detached, the alveoli were found empty and devoid of any epithelium; while the cells so displaced formed a mulberry-like conglomeration. Whilst there can be no doubt that these large cells were the altered alveolar epithelium, it is equally conclusive, from their swollen, granular, and multinuclear condition, that they were in a state of active proliferation. To compare this condition with one due to mere imbibition, lungs from patients with pulmonary oedema and rabbits' lungs injected with water immediately after death, were examined. But here the appearances were found to be very different; the alveolar cells were large and swollen, but almost hyaline and the nucleus but faintly visible, and nowhere could cells be seen containing more than one nucleus.

Some few rabbits left to themselves after section of their vagi died from ten to fourteen hours after the operation. Their lungs, microscopically examined, showed the lower lobes red and swollen, and from a section flowed a quantity of blood mixed with frothy mucus; by far the greater portion of the lung floated in water. Hardened sec-

tions showed the alveoli filled partly only with the swollen epithelial cells above described, while the remainder was distended by lymphoid cells, of which a larger and smaller variety could clearly be distinguished; the larger differed in nothing from the ordinary lymphoid cell, while the smaller variety was much less granular, and showed, on the addition of acetic acid, a very transparent nucleus, with a very hyaline nucleolus. The capillaries around the alveoli were again found very tortuous and swollen, and contained an abnormally large quantity of white blood-corpuscles; numerous lymphoid cells were also seen in the interstitial tissue. Two strong rabbits were killed ten hours after the operation, and their lungs presented very much the same features as those from the rabbits which were allowed to die.

In a second series of experiments, I tried to produce inflammation, not by section of the vagi, but by injection of an irritating fluid into the lung. The fluid used was a solution (5 to 20 per cent.) of nitrate of silver, of which a few minims were injected into the lung through the trachea, by means of a subcutaneous injecting syringe. The method was found successful, and presented many advantages over the first method; for other animals also, such as dogs and guinea-pigs, could now be used, and the amount of inflammation produced could be regulated by the strength of the solution; the operation, moreover, being but slight, the general effects also could be better watched.

Soon after injection the respirations and the pulse increased, while the temperature remained stationary or showed but a slight rise;\* the animal became listless and refused food, and when left to itself and a stronger solution used, died from ten to twenty hours after the operation; two stronger rabbits and a dog, however, recovered. The microscopic changes corresponded exactly to those obtained in the first series, and the results may therefore be briefly summed up. A few hours after the injection the alveoli of the parts of the lung affected were found gorged with large epithelial cells in an active state of proliferation. In guinea-pigs, which almost all died a few hours after the operation, and in rabbits where a dilute solution had been injected, this was the only change observed; in those rabbits which were allowed to die and in those where a strong solution had been injected and where the animals were killed eight to ten hours after the injection, other changes were observed. The alveoli contained a quantity of large and small cells. The larger cells were recognised as the swollen and proliferating epithelial cells, some of which were showing signs of fatty degeneration; the smaller cells consisted of lymphoid cells and smaller cells with a single round nucleus and very hyaline nucleolus. The capillaries surrounding the alveoli contained large quantities of lymphoid cells, while a few such cells were also seen in the interstitial tissue.

The conclusions, then, which may be drawn from these researches are these:—

1. That both by section of the vagi and by the injection into the lung of nitrate of silver an irritative inflammation is produced in animals comparable to the acute catarrhal pneumonia in man.

2. That the first stage in this process consists in an active proliferation of the epithelial cells lining

\* In guinea-pigs, which survived the operation but a few hours, there was a steady fall of the temperature.



the alveoli, which become detached from the walls of the alveoli, increase in size, become more granular, and show multiplication of their nuclei, and thus give rise to new cells. The small cells with the hyaline nucleolus above described are probably the young cells so formed.

3. That the capillaries in the neighborhood of the alveoli undergo an active hyperæmia; the white blood-corpuscles accumulate in them, and eventually (when the alveolar epithelium is detached) emigrate into the alveoli.

4. That the epithelium, after the process of proliferation is completed, undergoes fatty degeneration.

It will thus be seen that the view I have taken differs from Friedländer's in ascribing to the epithelium a very active part in the pathogenesis of this process. That these results accord much more with the histological features observed in catarrhal pneumonia in man nobody will deny. I have repeatedly examined lungs affected with acute catarrhal pneumonia both in children and in grown-up persons, and lungs where lobular pneumonia was found near caseous products, and found the closest resemblance between the large multinuclear cells seen there and the proliferating epithelium above described.

Apart from these actual observations there are some other considerations which support the views expressed above. Thus, the lung epithelium certainly resembles the endothelium lining serous cavities; and Buhl,\* in fact, looks upon the two as identical, a view which derives some aid from the researches of Sikorsky;† and Ranvier‡ has proved that, in the inflammation of the peritoneum, the first stage consists in an active proliferation of the endothelial cells lining that membrane, and the correctness of his statements can be easily verified. That, therefore, a similar condition of things should obtain for the lung epithelium is not at all surprising.

The diapedesis of the white blood-corpuscles observed in the subsequent stage in the artificial pneumonia produced in the experiments above detailed, is evidently an equally important factor in the process. Besides being quite in accord with the recent views on inflammation generally. Slavjansky§ has experimentally demonstrated such an emigration into the alveoli of the lung in rabbits and guinea-pigs.

Manchester.

#### NOTES ON

### THE ADMINISTRATION OF ALCOHOL IN THE TREATMENT OF DISEASE.

By BENJAMIN W. RICHARDSON, M.D., F.R.S.

(Continued from March Number, p. 137.)

#### III.

THERE is another class of cases of the hæmorrhagic kind in which the administration of alcohol is, according to my experience, indifferent prac-

tice. I refer to cases of recurrent hæmorrhage, cases typically seen in simple recurrent menorrhagia in women. The patient under these circumstances, greatly reduced in power, is easily misled by her own sensations to think well of alcohol. She is mentally and physically feeble. She takes, in periods of lowness, a glass or two of wine, or a large draught of stout, and for a time she feels so much relieved by the assumed remedy that she resorts to it again and again, as if it were her only support. There comes a stage at last when this belief is so firmly accepted that nothing, however reasonably or cogently said, can remove it.

The results of the treatment are, at the best, dangerous; at the worst, disastrous. There is engendered a dislike for natural good food, a depraved appetite, and a persistent dyspepsia. The bowels are rendered irregular—at one time sluggish, then relaxed; and the stomach and intestines are frequently distended with flatus. The action of the heart is feeble and irritable. The mind is depressed, and the emotions are either excited into hysterical elation or lowered into despondency. With these symptoms there is the continuance of the hæmorrhage, for a time passively, at periods actively and copious. We administer steel, or steel and quinine; we administer mineral acids; we administer gallic acid, or other styptic remedies. We employ astringent injections or other local methods for arresting the loss of blood. All our remedies, useful though they may be, are imperfect, and are slow in their operation, even when they are curative in their ultimate effect.

My experience of this class of cases now is that the first point of practice in their treatment consists in withdrawing the alcohol. As soon as the unrest which alcohol induces is set up, the vascular depression at one moment, the quick excitement at another, is allayed, and the cure commences. Peace is secured. The current of the blood flows on in steady stream; the blood regains its plasticity; the weakened vessels have rest; the nutritive changes are more naturally carried out; the nervous system is toned to even tension; and the signs of amendment begin to appear. Then our remedies seem to be endowed with new virtue, and recovery is the natural consequence. I exclude of course from these examples of chronic hæmorrhage all in which the blood is derived from a malignant source. In these the rule of abstinence from stimulant is good also, but the benefit of it is not to be accepted, as in the other instances, for a method of cure.

Patients suffering from chronic loss of blood, and who are in the habit of taking alcohol to meet the sensation of exhaustion to which they are constantly subjected, are often very difficult of treatment. They hold by the assumed remedy hard and fast, so that it is necessary to be most firm in relieving them from its bad influence. As a general fact, I find that no half measure, no temporising measure, is of avail. If one glass of wine be permitted occasionally, two will be taken, and that means a continuance of the vicious system.

The argument used by the patient against the withdrawal in these cases is special. It is that some kind of undefined but terrible danger must or will occur, if all the so-called alcoholic support is withdrawn. The only danger I know of, and that is real, is to the practitioner, who runs a risk of losing the confidence of his patient if he too determinedly maintains his position. The people

\* Lungenentzündung, Tuberculose, and Schwindsucht, 1873.

† Centralblatt, 1870, No. 52.

‡ Cornil and Ranvier, vol. i., p. 74.

§ Virchow's Archiv, xlviii., p. 326.

generally, even the best educated of them, do not understand this question as we medical men do, and so they persist in defending an engrafted belief which an acquired appetite often sharpens to a very fine edge indeed, with an obstinacy, and, I might say, a skilfulness of argument which is truly perplexing.

The best means of securing confidence is to learn it first; to make sure by observation that the treatment suggested is safe, and having gained this knowledge with certainty, to impart it without a shade of doubt.

It is, of course, a matter of great practical moment to be sure that it is safe to withdraw from a patient that which for a period, and for long periods, seems to confer signal benefit; and for my part, if I had hesitation on the subject I would express the same. But, so far, I have not the slightest evidence before me of any harm whatever accruing from the entire and sudden withdrawal of alcohol in the class of cases under consideration. On the contrary, when the appetite for the stimulant is appeased, and the mental worry and fear which attend the withdrawal are calmed, I have never seen anything but good as the result of the practice. My experience further is that the lower a patient feels, the greater is the reason, as a general rule, for enforcing total abstinence. The chances are large that the lowness which the alcohol relieves will be intensified when the effect of the brief stimulation it has produced has passed off.

I have brought forward as types of the chronic hæmorrhagic cases those of menorrhagia first, because they are most common. I include, however, under the same class, others where blood is recurrently lost. Cases of loss of blood from piles are treated with much greater success, and with much more certainty of cure, when total abstinence from all alcoholic drink is enforced. The effect of alcohol is so decidedly to induce congestion of the liver, and venous congestion of the hæmorrhoidal veins is so ready a consequence, that many persons I have known who have been subject to bleeding from hæmorrhoids have suffered proportionately to the degree of their indulgence. All have been benefited by abstinence.

In the treatment of hæmoptysis it has been my practice at every stage of my medical career to enforce abstinence from alcohol as a part of the treatment. This practice I gleaned from an early lesson, and I have never seen any result from it except the best. It is indeed singular to observe that in the treatment of this form of hæmorrhage the administration of alcohol is, with an all but common consent, forbidden by practitioners of medicine. In the many cases of hæmoptysis I have seen and in the varieties of practice I have witnessed, I cannot recall an instance in which alcohol has been prescribed or recommended in any form as a remedy. I think I may say I do not remember a case in which it has been systematically permitted. That this practice of withdrawing stimulants in hæmoptysis prevails so generally is not wonderful. It is begotten of the fear of exciting a recurrence of the hæmorrhage by stimulating the heart. It is sustained by the manifest wisdom of the practice, by the observation, so widely confirmed, that in the worst stages of pulmonary disease the hæmorrhage ceases under the abstinence, and is in the rarest of instances the cause of death. Nevertheless, it is wonderful that

this disease hæmoptysis should have been made so remarkable an exception in respect to treatment; and that the success of treating it without stimulation, even when the powers of life are at their lowest ebb, should not have suggested the applicability and soundness of the same treatment in all other hæmorrhages, acute and chronic.

(To be continued.)

## ON A PECULIAR APPEARANCE OF THE CONJUNCTIVA IN SOME CASES OF NIGHT-BLINDNESS.

By SIMON SNELL, M.R.C.S. Eng.,

Surgeon to the Sheffield Eye Dispensary.

My attention, during the last two years, has been directed to an appearance of the conjunctiva occurring in several cases of night-blindness, which, so far as I have been able to ascertain, does not seem to have been hitherto described; I trust, therefore, that a short account of some of the cases may not be considered altogether uninteresting.

Walter D—, four years of age, was brought by his mother to me at the Eye Dispensary on June 13th, 1874. She stated that ten days or a fortnight previously, when out with him one evening, as it was beginning to get dark, she noticed he could not distinguish between the road and the foot-path, so that he kept slipping off the causeway, but was always better when he came near the gas-lamps. At the time of his coming to me he was unable, as evening set in, to recognise even his mother only a few feet distant. He was a hearty, strong-looking boy, and had always been so. His parents also appeared healthy. The pupils of both eyes were somewhat dilated. The ophthalmoscope yielded merely negative results: no deposit of pigment in retina nor diminution of its arteries. In the conjunctiva, however, at a short distance from the cornea on either side, was a small, glistening, greyish, and somewhat square-shaped patch. It apparently consisted of a number of minute bubbles, freely moving with the conjunctiva, and which were easily dispersed on pressure, but always reappeared after a variable period of some hours. These patches were more marked on the temporal side of either eye. He was ordered cod-liver oil and steel. On July 11th the mother reports him as "quite recovered. He sees perfectly well at night now, and the conjunctival patches are entirely gone." I saw this little boy two or three months ago, and found that he had continued well, having had no recurrence of the night blindness.

Hugh S—, aged seven, came under my care May 15th, 1875. He had been observed not to see well at night for a fortnight, when his father had him in the garden at dusk, and instead of keeping to the ordinary path, the boy was walking into a deep pond. In many other ways also his inability to see well at night had been noticed. Both pupils were moderately dilated. The ophthalmoscope disclosed nothing abnormal in the fundi oculorum. Patches similar to the last case, only larger, were found in the conjunctivæ of both eyes, disappearing also on pressure, and more developed on the

temporal side. This was the second attack. Last year at the same time he was under observation. The patches in the conjunctivæ were then much more marked, and it was on account of having noticed them that his mother brought him for advice. On being questioned, the presence of hemeralopia was easily and clearly established. The patches then were triangular in shape, with their bases turned towards the cornea, and occupying the space between the lids. He recovered, and was well up to the present attack a fortnight ago. He was now ordered cod-liver oil and steel. His mother, however, taking him away for change of air, he did not make his appearance for some time, but when seen at the end of July was entirely recovered, the conjunctival patches having disappeared as his vision at night improved.

The following interesting family were under the care of my colleague, Mr. Gillott, with whom I examined them, and to whom I am indebted for permission to make use of them. For some time, and in several cases, he has noticed this condition of conjunctiva.

Mrs. G—— brought her little boy J., aged six, in March, 1875, on account of his inability to see properly, and for stumbling over things at night. He had been similarly attacked last year. The conjunctivæ presented patches like the preceding cases, but instead of there being two in either eye there was but one, and situated at the outer side. She said that her other children were similarly affected as night approached, and noticing on going home patches on their eyes like those in the boy J., she brought them all at her next visit. There were two boys and two girls, besides a baby in arms who was quite well, making in all, with the boy J. previously mentioned, five suffering from hemeralopia. Their ages were, W., ten years; E., eight years; J., six, similarly attacked last year; H., four years; F., three years. With the exception of J. none had so suffered before. All presented conjunctival patches like the cases before described, disappearing on pressure; but in each eye there was only one patch, and that on the temporal side. The mother, a very intelligent woman, gave satisfactory evidence as to the presence of hemeralopia in each of them. The pupils in every case were moderately dilated. Ophthalmoscopic examination disclosed nothing abnormal, except in one or two, where we thought the retinal vessels looked a trifle veiled, as if there were some small amount of retinal effusion. Towards the end of May they had all perfectly recovered. The conjunctival patches had entirely disappeared. They were as healthy-looking and rosy-cheeked children as one would find in any family.

These cases will suffice, without mentioning others, to illustrate the conjunctival appearance spoken of. None of the cases above described presented any marked changes in the fundus oculi; for although in one or two we thought there appeared some veiling of the vessels, it was so slight as to be doubtful. Certainly none exhibited the amount of retinal haze, dilatation, and tortuosity of veins mentioned by Quaglini\* as constantly seen in cases of acute (simple) hemeralopia. There was, however, the dilatation of pupil and tendency to recurrence often described. As to the peculiar appearance of the conjunctiva, I have never seen the like in any other condition than

hemeralopia, and, since my attention has been directed to it, have found it in every case of simple hemeralopia which has come under my observation; all of which, however, have been children. The patches appear to commence with the disorder, and to disappear as vision at night improves. Quaglini, in the paper before referred to, states that "there is no external alteration of the ocular membranes, except some varicose sub-conjunctival vessels, deficient brilliancy and liveliness of the cornea." On the other hand, Bitot\* describes a pustular condition round the cornea in an epidemic he witnessed, and which he thought pathognomonic of the disorder. Netter,† however, who had observed the same epidemic, was not of that opinion. Mr. Soelberg Wells‡ also, who has noticed a similar appearance in cases of night-blindness caused by exposure to the burning sun of the tropics, thinks it only a "thickening and desiccation of the conjunctival epithelium from exposure to intense heat." The cases I have briefly detailed had not been exposed to any great heat, and, as I understand it, the appearance I have described is different from that mentioned by the writers referred to. In these cases the epithelium did not appear thickened, nor was there any pustular eruption; but there were what seemed like tiny bubbles, which dispersed on being pressed.

The cause of the hemeralopia in these cases appears very uncertain. They were all the children of healthy and, apparently, strong parents, who were of the better artisan class, who lived comfortably, and no doubt their children were well fed and well attended to. An interesting point is, that all the children mentioned here came from one large district of Sheffield; which, however, is loftily situated, and is, I believe, generally considered healthy. Other cases have come before me from quite a different locality.

Sheffield.

## RARE CASES OF IRITIS IN CHILDREN NEAR THE AGE OF PUBERTY.

WITH REMARKS.

By EDWARD NETTLESHIP, F.R.C.S.,

Surgeon to the South London Ophthalmic Hospital.

THE two following cases, illustrating a very rare event, the occurrence of uncomplicated iritis at, or rather below, the age of puberty, and without apparent cause, seem deserving of record; since simple iritis, unaccompanied by disease of either the cornea or the deeper structures, is scarcely ever seen below the age of puberty, excepting in infants suffering from inherited syphilis.

CASE 1. *A mild attack of iritis in one eye in a girl aged fourteen years; no complications; no cause assigned.*—Louisa P——, aged fourteen, came to the South London Ophthalmic Hospital on Aug. 18th, 1875, with slight inflammation of four days' duration in the right eye. There were all the symptoms of commencing iritis:

\* Gazette Hebdomadaire, 1863.

† Gazette de Paris, 1863. Bitot and Netter are quoted second-hand, as I have been unable to refer to the originals.

‡ Treatise on Diseases of the Eye.

\* Hemeralopia, by Quaglini. (Ophthalmic Review, Oct. 1866.)

ciliary congestion, slight muddiness of the aqueous, and loss of brilliancy of the iris; but the pupil was still active. A two-grain solution of atropine was ordered. On the 21st the congestion had increased, the aqueous was duller, and the pupil, although showing no synechiæ nor any pigment spots on the lens-capsule, would not dilate fully with atropine, and remained oval after its use. Ordered to continue atropine drops and to take three-grain doses of iodide of potassium with ammonia. On the 25th the pupil had dilated more fully, and a single tag of adhesion was found at its upper part, the part which had hitherto responded least to the atropine. There was still moderate ciliary congestion, but no pain. At the next visit (28th) the eye was much better and the congestion had almost disappeared, and a week later (Sept. 4th) it was quite pale. Atropine was now discontinued, and a bitter mixture substituted for the iodide, which was depressing her. On the 11th the eye was still quite quiet, and I have not seen her since. The attack, although quite well-marked, was mild throughout, and showed no tendency to relapse. There were no opacities in the vitreous nor any disease of the fundus.

No clue was found as to the cause of the eye affection. Careful inquiry, both of the patient and her mother, threw no light on it. Neither rheumatism nor gout was known in the family; there was neither evidence of, nor any reason for suspecting, syphilis, acquired either in the ordinary way, by vaccination, or otherwise. There was no history of injury. She was a pale, rather thin girl, and her mother thought she had been losing flesh lately. She had not yet menstruated. She showed no signs of inherited syphilis.

*CASE 2. Iritis, acute and well marked, in one eye of a healthy boy aged fifteen; a thin membrane formed over pupil; no cause found.*

—Henry P.,\* aged fifteen, a healthy-looking boy, well nourished, and of good color, came under care on December 28rd, 1874, for iritis of his right eye. At the first visit there was slight general haze of cornea, muddy aqueous, and great congestion, but no iritic adhesions. The congestion was chiefly conjunctival. I was quite unable at this or at any subsequent visits to find a cause for the iritis; the most careful examination of his person failed to detect any evidence of primary or secondary syphilis, and he denied, I think truthfully, ever having been exposed to risk of venereal disease. From the state of the genitals it is probable that he had not arrived at puberty. He was not subject to any arthritic symptoms, nor could he learn from his relatives that there were any such complaints in the family. I made special inquiry as to gout. He showed no evidence of hereditary syphilis.

At his next visit the signs of iritis were much more pronounced, and eventually the pupil became covered by a thin greyish-white membrane, and its edge considerably adherent to the lens-capsule. The fundus was examined repeatedly, and no disease of the vitreous was found. There was no ulceration of cornea whatever.

For the first week the case was treated with iodide of potassium, atropine and blisters; but finding on December 30th that he was decidedly worse, I ordered grey powder in two-grain doses twice daily, with the same of Dover's powder,

omitting the iodide. This treatment, together with atropine, was continued for six weeks. The eye improved rapidly under it, and was quite quiet at the end of that time. All treatment was omitted for a month (February 17th to March 17th); at the latter date "relapse of ciliary congestion, no pain," is noted; treatment resumed for three weeks. On April 7th the eye was again quiet, and he has not been seen since the 14th. Not the slightest salivation or inconvenience occurred throughout the treatment, nor was his health apparently affected for better or worse.

It would not seem that these cases can fairly be placed in any one of the groups into which it is customary to divide the subject of iritis. The iritis of hereditary syphilis, occurring as it does in the secondary stage of the disease, and a few months after birth, could not include such cases as the above; while in neither of them was there any reason whatever for suspecting acquired syphilis. The large group variously known as "rheumatic," "arthritic," and "recurrent" iritis would not, I think, be commonly understood to include such cases as the above. Rheumatic iritis seldom if ever occurs under twenty years of age, and in a large majority of its subjects there is a history of some rheumatic affection; in men the rheumatic affection being often found to have begun as gonorrhoeal rheumatism. Neither would the smaller group, first differentiated, I believe, by Mr. Hutchinson, consisting of iritis in adolescents who inherit the gouty diathesis, appear to admit cases resembling those above given. In the cases described by that author† the disease was characterised by its extremely insidious onset, and an almost entire freedom from the ordinary signs of inflammation, by the occurrence of opacities in the vitreous, and by the tendency to progress to closure of the pupil and secondary changes in spite of treatment. In the two cases narrated in the present paper not one of these leading characteristics of the heredito-gouty iritis was present, for the disease was acute, of comparatively short duration, and not accompanied by any visible change in the vitreous. Moreover there was no history of gout in the parents or ancestors of either patient—a negative fact which must be allowed some weight, although it cannot be taken as conclusive. It is scarcely needful to distinguish between the cases forming the subject of these notes and those groups in which iritis occurs as a complication of certain diseases of the cornea; particularly of interstitial (syphilitic) keratitis, and of certain forms of cyclitis with marginal ulceration of the cornea.†

A case, not at first sight comparable with those here described, but possibly illustrating an extremely severe result of a similar form of disease, I have recorded in the Ophthalmic Hospital Reports (vol. vii., p. 360.) In this case a healthy-looking boy, eleven years of age, lost his right eye from acute irido-cyclitis leading to inflammation of the vitreous and retina, without any adequate cause being discoverable.

A detailed record of all cases of uncomplicated iritis in children below puberty (excluding, of course, the infantile syphilitic cases) would probably throw much light on the causation of these

\* See Clinical Lecture published in THE LANCET, April, 1873.

† For some very suggestive and valuable remarks on the latter disease by Mr. Hutchinson, see Ophthalmic Hospital Reports, vol. viii., pt. i., p. 5, under the title of "Makenzie's Scrofulous Scleritis."

\* Though the surname of each begins with P, the names are quite different, and the patients not related.

rare forms of disease, and perhaps result in placing them within one of the already recognised groups of Iritis.

Wimpole-street, W.

## ON THE OCCIPITO-POSTERIOR POSITIONS IN MIDWIFERY.

By JAMES MORE, M.D.

THE mechanism of labour is to a great extent a question of fine adjustment and adaptation between the foetal head and maternal passages; and a labour, to be natural, must proceed so that the longest diameter of the foetal ovoid adapts itself to the longest diameter of the pelvis, and this we know to be the right oblique.

Are, then, all presentations of the head occurring in other than the right oblique, and with the occiput looking to the left groin, unnatural? This has been answered in the negative by the younger Naegele, Simpson, and others, who maintain that the third position, occurring as it does so often, must rank as a natural presentation.

We know that when the forehead is primarily situated behind either the left or right foramen ovale, nature, as if aware the position is not the most satisfactory, attempts by a rotatory movement to bring the head into a position more favorable for delivery—viz., the occipito-anterior. Unfortunately, this rotation is not always accomplished, and thus it is we have so many cases of tedious labour when the presentation is either in the third or fourth position. I do not look upon occipito-posterior positions as always causing delay, but what I maintain is that in a large proportion of these delay does take place, and chiefly in those cases where nature cannot of herself change the position from the occipito-posterior to the occipito-anterior. The very fact that nature does attempt to rotate, coupled with the fact that most of our cases occur in the first position, leads me to the belief that the first is the natural position, and all others are deviations, and likely to cause delay.

In all head presentations we must keep before the mind's eye the fact that the head is not only in the oblique diameter, but the head itself is presented obliquely—i.e., more of one parietal surface is felt than of the other. So far as my observation goes, all those occipito-posterior cases in which there is delay, in which nature cannot rotate, are those in which there is an abnormal tilting or obliquity of the foetal head.

This tilting, indeed, occurs to such an extent that the ear can be invariably felt, and that without any force being used in the examination. In speaking of the diagnosis of these positions, Sir James Simpson says:—"In no case, I believe, will you find it necessary to force your finger up so far as to touch the ear of the child, as some authorities advise." Now this is quite true of all ordinary cases of "occipito-posterior" positions when the diameters of pelvis and maternal passages are in perfect accord as to size, &c., with the foetal head. But when these positions occur where there is disproportion between the head and maternal passages, then we have great and abnormal parietal presentation, and the ear can be felt without the

slightest difficulty. I may add that we cannot by any manipulation, short of course of introducing the hand, feel more than one ear.

Nor is it difficult to understand how this abnormal parietal surface obtains in these positions in certain cases. The spine of the child being attached nearer the occiput than the chin, and as the force of the uterus is transmitted along the spine, and as the long diameter of the foetal ovoid presents at one of the oblique diameters, perhaps in some way not suitable for its transmission, it follows that one of the parietal aspects of the occiput (if I may be allowed the expression) will impinge on one or other of the pelvic sides or brims, thus causing a tilting either to one side or the other—in fact, causing the head to assume the third or fourth position. Such I believe to be the mechanism of those cases of occipito-posterior position in which natural rotation has not or cannot take place, and in which, I believe, instrumental aid is necessary.

No doubt every accoucheur has seen cases where nature, though not able to rotate, has yet accomplished delivery, with the forehead coming out under the arch of the pubis; but this was where nature could not help herself, and delivery was effected only after great expenditure of strength to the woman and manifest risk to the child. When she can nature will alter these positions, for she finds them not suited to the safe passage of the head; and what I hold is that when we find that rotation is not likely to take place, and the labour is in consequence protracted, we ought at once to put on the forceps and effect the required alteration. I am very far from advocating the use of forceps in all cases of occipito-posterior presentation, but in those cases only where there is this abnormal tilting of the head, where the ear can be easily felt, and where there is delay. Such cases seem to me to be truly deviations from the natural mechanism of labour, and, unless they quickly and spontaneously rectify themselves, should be assisted by the accoucheur. This truth was very forcibly placed before me in a case I had not many months since. It was the case of a highly nervous multipara with the head presenting in the third position, in which, though the parts were tense and tight, I had no difficulty in feeling the left ear. She objected strongly to the use of instruments, and I waited on and allowed nature to finish the labour; and a nice time she took to do it, over ten hours, under strong pains. The child's forehead was forced through the outlet without rotation, and afterwards the body of the child was forcibly turned round, as if nature determined to give me a forcible illustration of what ought to have been accomplished by art. There was a wheal along the child's head as if it had been struck with a whip, and the mother made a very unsatisfactory recovery indeed.

The diagnosis of these positions by the fontanelles is decided enough, but in many cases is a matter of considerable difficulty. In those cases above referred to, where it is almost always necessary to interfere, there is one method of diagnosis which, for practical utility, seems to me the best, inasmuch as it not only verifies the position, but indicates the direction in which the accoucheur ought to rotate. Thus, if the presentation is in the third position, we find the finger can be carried up easily to the left ear; if, on the other hand, it is in the fourth position, we can just as easily reach the right one.

The practical utility of this means of diagnosis is that, having assured himself of the presence of the ear, all the accoucheur has to do is to rotate away from the ear. Thus, in the third position he would rotate away from the left ear, bringing the forehead round to the left sacro-iliac synchondrosis; the occiput would then of course be opposite the right foramen ovale—in fact, he would change the third into the second position. And this is strictly following the mechanism of such cases which require no aid, for "the second position is an ulterior stage in the progress of cases which originally belonged to the third." In the same way, and on the same principle, if we have the fourth position we rotate away from the right ear, bringing the head into the first position.

Of course, if one is perfectly assured of the position from examination of the fontanelles, nothing more is wanted; but often this is a matter of difficulty, and, indeed, in some instances it seems to be impossible.

Rothwell, Northamptonshire.

## ON DILATATION OF THE FEMALE URETHRA.

By ARTHUR W. EDIS, M.D.,

Assistant Obstetric Physician, Middlesex Hospital.

THE clinical essay of Mr. Teale, and the remarkable case cited by Mr. Hewetson in *THE LANCET* for March, encourage me to publish the notes of two cases that may possibly prove of interest to the profession, as illustrating the necessity of caution in adopting this expedient and also the importance of excluding other possible causes of irritable bladder before resorting empirically to forcible dilatation of the urethra. I have notes of a large number in my case-book, but select the following as illustrative of many others. The conditions most frequently producing irritation at the neck of the bladder, with painful or frequent micturition, apart from any alteration in the quality or quantity of the urine itself, are chiefly vascular growths in the urethra, cystitis, stone in the bladder, passage of small renal calculi, pressure upon the neck of the bladder from an ante flexed fundus uteri, dragging down of the posterior wall of the vagina (as in cases of prolapsus uteri), fissures or cracks in the urethra, extension of malignant disease from the uterus, or malignant degeneration of the bladder itself.

CASE 1.—M. D—, aged forty-two, married, sterile, first consulted me in December, 1872, for irritability of the bladder. Micturition was frequent and attended by scalding. The symptoms had come on gradually during the last month or six weeks, and had lately much increased in severity, the patient being obliged to get up several times during the night to pass water.

Examination of the urine detected nothing abnormal beyond the presence of lithates. On examining per vaginam, there was no evidence of any unusual discharge. The vagina was moist and cool; no vascularity of the urethra was apparent; the uterus was normal in bulk and position. No local lesion likely to account for the symptoms was found. On exploring the bladder by means of

a sound, no calculus was felt. The only unusual symptom was soreness of the urethral passage, but, as the patient was very nervous, it was thought at the time to be nothing calling for further attention.

Saline aperients with diuretics and restriction of the diet were enjoined, and the patient urged to resist the desire to micturate so frequently.

As the irritability of the bladder and soreness on micturition persisted, a pair of leeching forceps, about the size of an ordinary quill, was inserted, and the blades forcibly dilated so as to distend the urethra. The little finger being then passed, roughness of the posterior wall of the urethra was detected, but as the operation caused much pain nothing further was done. Later on in the day I received an urgent summons to visit the patient, and found her very weak and faint, lying in a pool of blood and urine. On making a local investigation a distinct jet of bright blood was seen after removing some clots and employing the catheter.

A No. 10 elastic catheter was inserted and left *in situ*, pressure being applied along the course of the urethra by means of cotton wool inserted per vaginam. This arrested the hæmorrhage for the time, but on removing the catheter the following morning, the bleeding recurred. A sound coated with cotton wool and saturated with solution of perchloride of iron was passed per urethram, which again arrested the hæmorrhage for a time, but it was not until a No. 12 elastic catheter covered with cotton wool steeped in tincture of matico was passed and retained *in situ* for twelve hours that the hæmorrhage was finally arrested.

The case caused me much trouble and anxiety, and impressed me forcibly with the risk incurred in resorting to forcible dilatation of the urethra.

The patient convalesced rapidly, regained perfect control of the sphincter within the course of a few days, and had no further symptoms of irritation.

CASE 2.—E. H—, aged eighteen, single, servant, presented herself as an out-patient, complaining of frequency of micturition. During the day she stated that she could only hold her water for about half an hour, and was obliged to get up at least five or six times during the night to empty the bladder. This condition had been gradually coming on during the last two years, and was always worse about the time of her periods, but had been much worse the last six months. Iron, belladonna, bromide of potassium, chloral, ergot, strychnia, and every other likely drug were given at different times, without more than the most temporary benefit. As the condition remained unaltered, she was admitted as an in-patient at the Hospital for Women.

A careful vaginal examination showed that the uterus was ante flexed, though not to a very marked degree. Buchu, uva ursi, triticum repens, alkalies, and acids gave no relief. Confinement to bed, restriction in the amount of fluids, blisters to the suprapubic region, the adjustment of an india-rubber ball inflated with air per vaginam so as to compress the urethra, injection of two-grain doses of morphia into the bladder, and every other available expedient was tried without avail. At this time Mr. Heath saw her in consultation, and suggested rapid dilatation of the urethra. Chloroform was administered and the operation performed; the neck of the bladder being brushed over with a

strong solution of nitrate of silver. The symptoms remained unchanged. The urine was passed between five-and-thirty and forty times during the twenty-four hours (as ascertained by the patient pricking a card with a pin every time she made water).

The case now seemed hopeless. The patient's condition was most deplorable. The frequent necessity for getting up during the cold winter nights, the discomfort from constantly wetting her linen, and the offensive ammoniacal odor produced rendered her existence almost unbearable.

Every method of relieving the bladder having been tried in vain, I thought, before discharging her as incurable, it would be well to try the effect of an intra-uterine stem. After some preliminary passing of the uterine sound, a small vulcanite stem was inserted, but was extruded within a few hours. Having made one with a bulbous extremity, this was inserted and was retained *in situ*. Within a few days she had perfect control over her bladder, and before leaving the hospital, some ten days after the insertion of the stem, she could pass the whole night without getting up, and only micturated four or five times in place of forty during the twenty-four hours. She took a place and remained perfectly well, until one day, hurrying to catch a train, the stem came out, when all the old symptoms recurred. She was obliged to come up to town and have it reinserted, and has done so twice during the last two years. During the present month she has written to say how very grateful she is for the relief, and that she remains quite well.

Wimpole-street, W.

## GLIOMA OF THE RETINA.

(WITH CASES.)

By GEORGE LAWSON, F.R.C.S.,

Surgeon to the Royal London Ophthalmic Hospital, Moorfields, and the Middlesex Hospital.

GLIOMA of the retina is a disease of early life, and, as far as my experience goes, it is limited to childhood. The youngest patient I have had under my care was an infant six weeks old, in whom the growth was probably congenital, and I have not met with a retinal glioma in a child beyond the age of five years. The disease usually commences in one eye, and after a variable period, seldom exceeding a year and a half, but often much earlier, the other eye becomes also affected. To this rule I know of two exceptions: one in a patient aged two years and eight months, from whom I removed the eye in 1872, and who has had no recurrence of the disease. The other was a patient of my colleague, Mr. Hulke, and continued under his observation for eight years after the excision of the eye, and had no return of the disease. Cases have been recorded by Knapp in which both eyes were simultaneously affected with glioma.

The causes which lead to the production of glioma are unknown. No hereditary taint can be ascertained to account for its occurrence. There is no family history of cancer in any of the relatives. The child affected is usually one of several

children, those born before and those after him having been healthy. The father and mother in nearly every case under my notice were living, and apparently in good health.

In appearance a glioma resembles very closely brain-substance. It is soft, of a white or yellowish-white color, and springs from the connective tissue (the neuroglia) of the retina. In structure it consists of a finely granular or amorphous intercellular substance, in which are embedded spherical, roundly oval, and occasionally spindle-shaped cells. As it grows, portions of it frequently undergo fatty degeneration and become so soft as to be almost fluid, whilst other parts become chalky or calcareous. It is usually of rather slow growth, extending over a period of from one to two years before it completely distends the globe and bursts through the sclerotic or cornea.

In the early stage of glioma of the retina there is no pain, and the disease is usually first discovered by the nurse or attendant noticing a bright yellow reflex from the fundus of the globe, and then, on closing the sound eye, it is found that the affected one is almost, if not completely, blind. The refracting media are generally clear, so that the growth of the tumour may be easily watched. As the disease advances there is an increased tension of the globe, and then the eye becomes painful and the child restless, frequently crying and starting in his sleep. The lens and iris are pushed towards the cornea, and the pupil becomes dilated and inactive. At a later stage of the disease the lens becomes cloudy and the cornea dull, and the tumour bursts its way through the globe and appears externally. It now seems to grow with an increased activity, and forms a fungating mass from which there are frequent recurrences of hæmorrhage, and the child dies either worn out by pain and exhaustion or from meningitis caused by an extension of the disease to the brain.

The prognosis of retinal glioma is very unfavorable. The only treatment is to excise the eye as soon as possible after the disease has been recognised. Not only is a chance of its non-recurrence thus afforded the patient, but future suffering is very materially diminished. Even when both eyes have been affected, and all hope of recovery was passed, I have excised first one and then the other eye, to give ease to the terrible sufferings of the child.

The following cases are illustrative of the above remarks.

*Retinal glioma in both eyes.*—George C—, aged two years and three months, was brought to the Royal London Ophthalmic Hospital on Oct. 1st, 1875, with both eyes affected with retinal glioma. The mother stated that she was certain that both eyes were quite healthy at birth, and she noticed no defect until the child was eleven months old, when she observed a "bright shining" from the bottom of the globe of the left eye. About three or four months ago the right became affected, and now the child is quite blind.

The disease in the left eye was found to be far advanced; the growth within the globe had pressed the lens and iris almost into contact with the cornea, which was semi-opaque. In the right eye the disease was less advanced. The humors were clear, and the tumour could be distinctly seen pressing forwards and occupying a large portion of the vitreous space. The child was emaciated, and had the aspect of much suffering. He was



very irritable, constantly fretting, and would awake at night crying, and start frequently in his sleep.

I advised excision of both eyes, but to this the mother would not consent. I excised therefore only the left globe, the one which was the cause of the greatest suffering. The child was greatly relieved by the operation.

*Congenital glioma; excision of the eye; recovery.*—Samuel J—, aged six weeks, came under my care at the Royal London Ophthalmic Hospital on the 30th of November, 1875, on account of a bright shining reflection, which the mother had accidentally discovered at the fundus of the right eye. On closing the sound eye she found that the affected one was blind. The child was fretful and restless, and evidently in pain. The parents were both healthy, and had three other children, all of whom were strong and well. On examining the eye, the glioma was at once recognised by the bright yellow reflex, which was seen without dilating the pupil with atropine. The growth occupied a considerable portion of the vitreous space, but had not advanced sufficiently to press forward the lens and iris; the humors were perfectly clear. I advised the mother to have the eye excised; and, after a fortnight's consideration, she gave her consent.

The eye was removed in the usual manner; and, on making a section of the globe, a soft glioma, about the size of a large horse-bean, was seen growing from the retina between the outer side of the optic nerve and the ciliary processes, and extending into the vitreous. A part of the growth had undergone fatty and chalky degeneration; it had become semi-firid, and scattered amongst the soft portion were some chalky fragments. The tumour had evidently been of longer duration than eight weeks (the age of the child), and had probably existed for some time in utero.

The child recovered rapidly from the operation, and was evidently much relieved by the removal of the eye.

Harley-street, W.

#### SUCCESSFUL EMPLOYMENT OF

### PHOSPHIDE OF ZINC IN A CASE OF MERCURIAL TREMOR, AND IN ONE OF CHRONIC ARSENICAL INTOXICATION.

By Dr. NOEL GUENEAU DE MUSSY,

Physician to the Hotel Dieu.

PHOSPHORUS has taken, during the last few years, a most important place in therapeutics, both as modifying the nervous system and improving its impaired nutrition.

About eight or ten years ago, M. Vigier, a very learned chemist of Paris, pointed out the advantages of phosphide of zinc. This preparation is much more stable, more definite, and more easily handled than phosphoric oil, which is commonly employed. Whilst the phosphoric oil is very easily altered by oxidation, and untrustworthy in its effects, no variation of power, no change of composition takes place in the phosphide of zinc.

Four milligrammes of this substance contain one milligramme of phosphorus, but in reality, accord-

ing to the researches of M. Vigier, the physiological action is equivalent to only half a milligramme. I always prescribe two pills of four milligrammes each to begin with, and proceed gradually to six pills when the physiological effects, which must be carefully observed, do not seem to be sufficiently marked. If any signs of intolerance appear, I suspend the course for some days, to begin again afterwards in the same way. Generally, after twelve or fifteen days I allow the patient to take rest, and discontinue the medicine during four or five days.

About ten years ago I had occasion to relate in the *Gazette Médicale*, and later on in my clinical lectures, the successful employment which I made of this substance in cases of tremor. A very striking case of this description has recently presented itself to me.

For more than six weeks the patient had been affected with a violent quivering of the limbs, which made him quite an invalid. He could not help himself in any way; and even when his arms were resting, lying on the bed, the trembling did not subside. He also complained of pains in his back, and his face was red and flushed. The gums were red, swollen, and bordered with a purple rim. Fearing, from the spinal pains, that the specific poisoning of the nervous system was attended with a congestive process, I did not venture to give phosphide of zinc immediately, but prescribed a purgative, and applied two small cauteries to the base of the neck. After some days, the pain being relieved and the symptoms of irritation somewhat abated, I prescribed two pills of the phosphide of four milligrammes each. After two days of this treatment, such was the improvement in the patient's health that he could walk alone and eat without being helped; and a few days later he found himself so well, though he was not completely rid of a slight trembling, that he insisted on leaving the hospital.

Another case lately occurred in my wards which gave me an opportunity of testing the modifying action produced on the nervous system by phosphide of zinc. A man of fifty years of age came into my wards complaining of pain and weakness in the back and limbs. He had not been able to walk or stand for one month. The left leg was much weaker than the right. This weakness extended to both arms, but was much more marked in the left one, which could not retain hold of anything, and presented signs of paralysis of the extensor muscles, and especially of the last three fingers. Sight and hearing were also much impaired on the left side. Tactile sensibility of the skin, investigated by means of the anæsthesiometer, was rather dull, though very slightly so. No alteration was noticed in the perception of heat, or weight, or pain. The vaso-motor action seemed impaired in the integuments of the hands, which were stained of a reddish-blue color. Pressure on the larger nervous branches, and especially along the vertebral grooves, excited such pain that the patient would start and scream. He had been employed in a manufacture of aniline-red, and had thus been exposed to arsenical vapors. This circumstance, and the recollection of a pamphlet lately published by Dr. Scolosuboff, of Moscow, led me to suspect that the nervous disorders observed in this case might depend on poisoning of the system with arsenic; and, indeed, the analysis of the patient's urine showed the existence of a

large quantity of this substance, and thus confirmed my suspicions. I first ordered some baths and the internal use of a mixture of sulphur and honey, in order to eliminate any remains of the poison deposited on the integuments; I then prescribed the phosphorated pills, and after three or four days I noticed a great improvement in the condition of the patient. He could walk and make use of his hands, the pains were abated, and the general appearance was much more satisfactory. After a fortnight he could distinguish with his left eye small printed characters, whilst he was unable before to make out even the largest type; he was also able to discern colors which hitherto had appeared quite confused to him. The patient is still under my care, and feels every day better, though the strength of the left limbs and of the extensor muscles is not yet quite restored.

In the above case some points deserve to be especially noticed. Paralysis, though general, was more marked on one side, constituting real hemiplegia, and extending to the organs of sense. The very interesting researches made by Dr. Sculosuboff, with the result of showing that the poison mostly accumulates in the nervous centres, can explain the fact, whilst the rapidity of the patient's recovery indicates that, notwithstanding the gravity of the symptoms, no deep lesion of the organic structures had taken place.

Paris.

#### ON A CASE OF

### DORSAL DISLOCATION OF THE HEAD OF THE FEMUR, WITH EVERSION OF THE LIMB.

By THOMAS ANNANDALE, F.R.S.E.,

Surgeon to the Edinburgh Royal Infirmary, and Lecturer on Clinical Surgery.

M. M—, aged twenty-nine, a sailor, was admitted into my wards on the 22nd of December last, on account of an injury to his left hip.

The history of his case was that six weeks before admission a bale of goods fell upon him while he was working in a stooping position. Being at sea at the time, he received no treatment except rest.

When examined, on admission, the injured limb was found to be shortened three-quarters of an inch and *everted* to its full extent. The whole limb was fixed in this everted condition. The great trochanter was displaced upwards and backwards, and the head of the bone could be felt over the situation of the sciatic notch. In addition to these symptoms, Mr. Syme's characteristic sign of sciatic dislocation was present—namely, that the injured limb could not be straightened without an arching of the spine. If the spine was straightened the thigh became flexed, and if the thigh was straightened the spine became arched. No crepitation could be detected. Having from all these symptoms diagnosed a sciatic or dorsal dislocation, the patient was put under chloroform on the 24th of December, and the manipulative method of reduction practised. The bone was readily reduced by flexing and adducting the limb and then making

it take a sweep outwards, but it also readily slipped out of the acetabulum again when the limb was moved; and in order to present its displacement a long thigh-splint was applied and retained for a month. At the end of this time the patient was allowed to rise from bed and use crutches, and two weeks afterwards he was dismissed to the Convalescent Hospital, being able to bear considerable weight on the limb. When the limb was examined before his dismissal it was found to be natural in length and position, and it admitted of free flexion, extension, adduction, and abduction at the hip. The only symptom complained of was some weakness of the whole limb, but this was gradually passing off.

*Remarks.*—The occurrence of eversion of the limb in cases of dorsal dislocation of the head of the femur is quite exceptional. The proof that this was a dislocation is that when the bone was reduced the limb became natural in length, position, and mobility. Bigelow, at page 100 of his valuable work on the Hip, refers to this form of dislocation, and considers that the unusual symptom of eversion depends on a more complete rupture of the capsular ligament, especially of that portion which forms the outer branch of the Y ligament. Reduction in the case reported was more easily accomplished than is usual in this form of dislocation, for in the cases reported by Bigelow considerable difficulty was met with in returning the bone to the acetabulum. Another interesting point in this case is, that reduction was so readily accomplished at the end of six weeks after the injury.

Edinburgh.

## A Mirror

OF

## HOSPITAL PRACTICE

BRITISH AND FOREIGN.

Nulla autem est alia pro certo noscendi via, nisi quamplurimas et morborum et dissectionum historias, tum aliorum, tum proprias collectas habere, et inter se comparare.—MORGAGNI *De Sed. et Caus. Morb.*, lib. iv. Proœmium.

### QUEEN'S HOSPITAL, BIRMINGHAM.

OVARIAN TUMOUR; TAPPING; INFLAMMATION OF THE CYST; OVIOTOMY; RAPID RECOVERY.

(Under the care of Mr. JOHN CLAY.)

THE following case, for the notes of which we are indebted to Mr. J. Spofforth, resident obstetric assistant, is interesting as illustrating—first, the liability of the occurrence of inflammation of the cyst after the operation of tapping; and, secondly, the comparative safety of ovariectomy after the supervention of inflammation. It must, however, be borne in mind that this case, and others like it, are exceptional, and must be regarded as such—that is to say, the fact that inflammation may occur after tapping is not an indication that the major operation of ovariectomy should in such cases be practised in the first instance.

A. S—, aged fifty-two, widow, was admitted on Nov. 9th, 1875. The patient always enjoyed good health until the present illness. She has had three children, the youngest nineteen years of age, and no miscarriages. Menstruation was regular till two years ago, when it ceased. About eighteen months before admission, while in the enjoyment of perfect health, she perceived a small movable substance in the right iliac region. This swelling, however, she said disappeared. In February, 1875, she had a somewhat sudden attack of severe pain in the right side of the abdomen, for which she obtained medical advice. After this the abdomen rapidly enlarged, and an ovarian tumour was diagnosed. In August this tumour was tapped by her medical attendant, and a pailful of clear, gelatinous fluid withdrawn. Towards the end of October, the abdomen had become as large as when tapped, and she applied for admission into the hospital.

When admitted she was emaciated, the face was pinched and of an anxious expression; she complained of anorexia and nausea, difficulty of breathing, a constant cough, and oedema of the lower extremities. The abdomen was enormously distended, the superficial veins enlarged, the surface smooth and uniform, and there was tenderness on pressure in two or three spots. There was dullness on percussion in front, and resonance in the flanks, with distinct fluctuation. The fluctuation could be felt within a number of limited areas only, which showed the cyst to be compound.

The abdomen measured at the umbilicus  $41\frac{1}{2}$  inches, and two inches above this  $40\frac{1}{2}$  inches in circumference; from the umbilicus to the ensiform cartilage  $8\frac{1}{2}$  inches, to pubes 11 inches, to right anterior superior spine  $12\frac{1}{2}$  inches, to left anterior superior spine 13 inches. Urine was healthy, sp. gr. 1030.

A vaginal examination proved the uterus to be of its natural size, slightly drawn upwards, and anteverted. Temperature of body normal.

On Nov. 17th she was again tapped, and 160 oz. of straw-colored, gelatinous, and alkaline fluid, of sp. gr. 1021, removed. Subsequently the chest symptoms were much relieved, and the oedema of the legs disappeared, but she complained of an acute pain in the right iliac region, and of great tenderness on pressure. The abdomen again became distended to about the same size as on the 17th, before she was tapped. The pulse became more frequent, and the temperature increased.

Suspecting inflammation of the cyst, Mr. Clay deemed it advisable to remove the tumour as soon as practicable, and on Nov. 27th the operation was performed. Ether having been administered, an incision was made five inches in length, below the umbilicus, in the median line. There was considerable hæmorrhage from some superficial veins, but it was arrested before the peritoneum was opened. The walls of the cyst were very thin, and gave way under the traction made by the hooks of Well's trocar. The patient was then turned on her side, and the fluid evacuated by pressure on the abdomen. After securing the slight adhesions that existed on the right side and in front, the pedicle, about four inches in length, came into view, was fixed with a clamp, and cut. A large cyst remained, which gave way whilst being withdrawn with the vulsellum forceps, and its contents, about 18 oz. of purulent fluid, escaped, but fortunately, owing to the patient being

on her side, none was allowed to enter the peritoneal cavity. The tumour was then freed from the remaining adhesions, and easily withdrawn. The tumour proceeded from the right ovary.

The wound having been closed with deep and superficial sutures of silk and wire respectively, the patient was removed to bed. Reaction was slowly established, and she was several hours before she recovered from the effects of the ether. The pain, occasionally very severe, was soon relieved by morphia administered hypodermically.

It is not necessary to record the daily progress of the case. The temperature only on two occasions exceeded  $100^{\circ}$  F., and the pulse averaged about 90 per minute. There was cystitis and incontinence of urine, so that, in spite of every precaution, a small bed sore formed over the sacrum on the tenth day, but as the patient was able to lie on her side, it gave but little trouble. She was well enough to sit up on the fourteenth day, although it was deemed advisable to delay her doing so till the seventeenth.

The cyst weighed 2 lb.  $17\frac{1}{2}$  oz., and the fluid contents which during the operation had been evacuated measured 250 oz. It was multilocular, consisting of two large cysts, with a dense mass of smaller ones. The largest cyst contained a quantity of purulent fetid fluid, with flakes of lymph of a dirty yellow color; its wall was thin, injected, very lacerable, with several hæmorrhagic patches on its surface.

## ROYAL INFIRMARY OF EDINBURGH.

### CASES UNDER THE CARE OF MR. JOSEPH BELL.

THE following cases, which have recently been treated in Mr. Bell's wards, are good illustrations of the extraordinary powers of recovery from severe and extensive injuries exhibited by young healthy patients. In all the cases the antiseptic method of treatment was carefully used for the injuries which required it.

CASE 1.—Peter B—, aged thirty-five, a short, thick-set, extremely muscular man, while engaged as a slater on a very high roof of an hotel which is being erected at North Berwick, fell a distance of between sixty and seventy feet on stones and rubbish. He had not been insensible, and when admitted to hospital, after a journey of upwards of twenty miles, was quite conscious. He had sustained a dislocation of the left femur into the foramen ovale. His left forearm was broken about the juncture of lower and middle thirds; both bones were broken, with considerable comminution and bruising. There was one large lacerated scalp-wound over left parietal and temporal regions, and the whole face, nose, and lips were torn, cut, and bruised, so that his features were not distinguishable. The dislocation was at once reduced by Mr. Bell under chloroform, by manipulation, the fractures set, and the wounds dressed antiseptically, so far as this was possible.

His recovery was absolutely uneventful; the highest temperature recorded in the case was  $100.2^{\circ}$  at one evening visit. The wounds healed entirely by first intention, and the hip never gave him the slightest inconvenience. He was dismissed on Nov. 27th, 1875, four weeks after his admission.

**CASE 2.**—George F—, aged twenty-six, a powerful railway laborer, was brought into hospital on Nov. 27th, after a journey of about twelve miles, including a ferry of six miles, with the following history. On a wet windy afternoon he was walking on the rails, and was struck by the engine of a fast train and knocked off the rails, with great force, against the rocks which bounded the line. He was quite insensible, though his pupils were freely mobile and equal. His right clavicle was extensively comminuted at the outer two-thirds, and separated from the acromion process of the scapula. Four ribs were broken on the right side, and extensive emphysema followed. The right upper jaw was shattered, and the right cheek divided into two from the angle of the mouth backwards nearly to the ear. The lower jaw was broken near the symphysis. An extensive triangular laceration reached from the root of the nose, across the forehead, nearly to the vertex, exposing the bone to the extent of nearly the size of a half-crown. For nine days the state of concussion continued, and he was restless, unmanageable, and delirious, pulling off the dressings and requiring constant watching. During all the time, however, his temperature only once reached 100°, and his highest pulse register was 90. The wounds were kept antiseptic, and his recovery has been complete.

**CASE 3.**—Alexander S—, aged seventeen, a stoker, was, on November 15th, 1875, knocked down by a loaded railway waggon, weighing thirteen tons, which passed over both his legs, crushing them to fragments. He was put into a cart, after the limbs were temporarily fastened up, and conveyed about twenty miles, including a ferry of six miles, to the hospital. The journey took several hours; and on admission at 5 P.M. he was so weak that it seemed scarcely possible he could survive. Mr. Bell amputated both legs as rapidly as possible, and with antiseptic precautions, just below the knee, saving skin flaps. Chloroform was given with a liberal hand, and the pulse seemed to rally under it. He was got to bed within fifty minutes, just alive and no more. Nourishing enemata were given; but it was not for twelve hours that the temperature came up to normal. The pulse was fluttering and irregular for at least twenty-four hours. The patient was watched day and night by relays of dressers for three or four days; and his progress on the whole was exceedingly rapid. The wounds kept sweet. His temperature was hardly ever above 100°. On the sixth day he was sitting up in bed playing the concertina. On the tenth day he was for a few minutes in the fresh air on the nurse's knee; and he is now out every day.

Such a recovery from a double amputation of lower limbs after railway smash, especially with the added shock of a long journey, is a very rare occurrence.

also from its exhibiting a rare complication arising from the pressure of the aneurismal tumour. The notes of the case (condensed) have been furnished by Dr. H. Law, the house-physician.

S. H. G—, aged thirty-seven, was admitted January 27th, 1875, complaining of general dropsy and chronic dysentery. He stated that his general health had been good till twelve months ago, when he had rheumatic fever, for which he was treated at the Shanghai Hospital, his employment being that of a pilot on Chinese rivers. After his discharge from the hospital he acquired dysentery, and three months before his admission dropsy set in, beginning in the lower parts and gradually invading the general integuments. No urinary derangement had been noticed.

When admitted he presented great general oedema of all parts below the neck, slight lividity of face, occasional cough with frothy sputum, dyspnoea on exertion. No thoracic abnormal dulness could be made out; heart's impulse barely perceptible through the greatly distended integument; sounds feeble; coarse crepitation at the bases of both lungs. No increase of hepatic or splenic dulness. Apparently some fluid in abdominal cavity. Urine diminished in quantity; no albumen. The stools were frequent (five to twelve a day), bloody, lumpy, and slimy. No history or evidence of syphilis.

The dysentery, under the castor oil treatment, yielded about the end of April. The dropsy increased till the legs and arms attained an enormous size, but in other respects for some time he improved. The shortness of breath was trifling and never paroxysmal, the cough abated, and he had no pain. Occasionally a faint short murmur of a rough character, intensified after a forced inspiration, was audible at the sternal end of the sixth left costal cartilage, not conducted in any direction. The urine remained free from albumen till a few weeks previous to his death. Puncture of the legs gave him relief for a short time, but effusion into the left chest presented itself about the end of June, and he sank. Death occurred on June 30th. Some time before his death a naval surgeon visiting the hospital recognised the patient, and remembered his having been in the Chinese Hospital; and he stated that it was thought at that time the man had some cardiac valvular mischief.

At the post-mortem examination a considerable quantity of fluid was found in the left pleura and abdomen. The pericardium was adherent, and a sacculated aneurism of the ascending aorta developed chiefly to the right side and posteriorly; from this aneurism another, smaller, projected forwards in close contact with the right auricle, which no doubt during life was pressed on by it; valves healthy and competent. The other organs presented nothing of special interest.

Dr. Ralfe observed that the difficulties attending the diagnosis of this case were of no ordinary kind. The history of the case, the statement that a valvular lesion had been detected some months previously, the presence of general dropsy, and a certain degree of bronchitis, led to the supposition that the obstruction to the circulation lay in some defect of the valves. Nor was the absence of any murmur that could be considered endocardial, opposed to such a view. At the same time, the possibility of the obstruction being caused by some thoracic tumour was not lost sight of. The patient being naturally fat rendered it difficult to de-

## SEAMEN'S HOSPITAL ("DREADNOUGHT").

A CASE OF AORTIC ANEURISM, GIVING RISE TO GENERAL DROPSY; AUTOPSY.

(Under the care of Dr. RALFE.)

THE following case is interesting, not merely from the difficulties attending the diagnosis, but

tect any increase of abnormal dulness, and this difficulty was augmented by the dropy in the integuments. Naturally, however, from the position and direction of the tumour, the dulness, even in a leaner person, would not have been very appreciable. The dropsical condition of the integuments also prevented an impulse being communicated. There was no pain, and all the usual pressure symptoms of thoracic tumour were absent. Dr. Ralfe thought the condition revealed by the post-mortem sufficient to account for the dropy. The right auricle, when charged with blood during life, would be in contact with the smaller and laterally projecting aneurism, and thus a considerable amount of obstruction to the circulation would be produced.

## ST. MARY'S HOSPITAL.

### NOTES ON SURGICAL CASES.

(Under the care of Mr. HAYNES WALTON.)

For the notes of the following cases we are indebted to Mr. Jackson Gawith, house-surgeon.

*Nævus of the Tongue; ligature; cure.*—The patient, a male aged twenty-six, healthy and robust, was admitted with a tumour growing on the left side of the upper part of the base of the tongue. The natural aspect of the tumour was somewhat destroyed by an attempt which had been made to remove the growth, the operator having abandoned his intention on account of severe bleeding which followed the first incision. After a careful examination, Mr. Walton decided that he had before him an example of a nævus of the tongue. He founded his diagnosis on the following facts: the long existence of the tumour, for the patient remembered having had it for twelve years; its prominence and sharp outline; its erectile-tissue-like structure, and the reduction of its bulk by pressure; and, lastly, the bleeding above referred to when the knife was used. Mr. Walton determined to operate by the process of ligaturing, and applied his quadruple symmetrical noose, taking care that the ligatures were carried sufficiently deep. On the second day hæmorrhage set in, but it was quickly stopped by the application of the tincture of the perchloride of iron. On the sixth day the tumour fell off, no hæmorrhage ensuing, leaving a clean raw surface. Cicatrisation proceeded rapidly, and the patient left the hospital on the eleventh day, the wound having very nearly healed. Four days later healing was completed, and there was no undue hardness of the tongue.

Nævus of the tongue is undoubtedly rare. Mr. Walton remarked that he had met with only one other instance in which it was deemed prudent to operate; in that also, ligaturing was employed. There could, in his opinion, be little doubt that, as a rule, the ligature is superior to the other methods of treatment.

*Popliteal Aneurism; failure of compression; ligature of femoral artery; recovery.*—The aneurism occurred in a mechanic, aged forty-five, without any known cause. A swelling in the right popliteal space led to the discovery of the disease, which was pronounced to be an aneurism. The foot and leg were already swollen, while the aneurism was large and the sac thin. In the

course of some clinical remarks, Mr. Walton said that, although he would try the treatment of compression, he thought that the interests of his patient would be best served by tying the femoral artery at once. It was to be understood that this little wavering on his part would make him watch the case narrowly. Pressure was applied to the femoral artery by means of a metallic tourniquet with adjusting rack-work, and very carefully looked after. With all the supervision that was exercised, the patient found the pressure more than he could bear, and with his distress the swelling of the leg increased in a very marked manner. All the while during eight days the aneurism did not consolidate, and the femoral artery was then tied in the usual place, care having been taken not to open the fascial sheath of the sartorius muscle, to place the ligature as low as it was possible, and to disturb the arterial cellular sheath no more than was necessary for the passage of the aneurismal needle. The wound was carefully stitched together, and covered with lint and a bandage. No antiseptics were used. The progress of the case was quick and uninterrupted. On the fifth day, when the cotton-wool packing was temporarily removed from the foot and leg for the purpose of inspection, it was discovered that the swelling was very much less. The wound healed by first intention, except where the ligature hung out of it; the ligature separated on the fourteenth day. In a month from his admission the patient left the hospital well, and with but a small trace of the aneurism, as a hard lump in the ham. He never returned to make any report of himself.

## DEVON AND EXETER HOSPITAL.

SEVERE DYSPNŒA; TRACHEOTOMY; EMPLOYMENT OF A LONG INDIA-RUBBER TUBE; RECOVERY.

(Under the care of Mr. CAIRD.)

THE interesting features in this case (for the notes of which we are indebted to Mr. H. Gordon Cumming, house-surgeon) were the obscurity of the cause of the symptoms, the coincidence of their disappearance with the decrease in the size of the thyroid, the disappearance of the latter after the severe hæmorrhage, and, lastly, the marked relief afforded by the long india-rubber tube. It was found that brushing the interior of the tube with olive oil considerably aided the passage of secretion.

J. P—, aged sixteen, was admitted Nov. 8th, 1875. He had always been delicate, and had suffered from shortness of breath on exertion, but was not subject to cough. Three weeks ago he first noticed a difficulty in breathing, which he fancied came on as the result of a cold, and, as it increased, he was compelled to seek advice. He gradually became worse under treatment, and was sent to the hospital.

On admission he was a tall, thin, anæmic lad, with anxious expression, and dusky appearance of face. Respiration was quick and very labored, and there was inability to remain long in the recumbent position. The thorax was drawn in to a remarkable degree at each inspiration along the line of sternum and costal cartilages, and there was also great retraction of the epigastrium, whilst

the inspiratory act was accompanied by a peculiar harsh noise. On auscultation, very little air was heard to enter the lungs, and the respiratory sounds were indistinct, but no dulness was audible on percussion. The heart sounds were normal, and the pulse quick and very feeble. The thyroid gland was much enlarged, both laterally and at the isthmus, which felt somewhat tense. Digital examination of the pharynx and upper part of larynx revealed nothing that could at all account for the dyspnoea.

He was placed under medical treatment in a separate ward, with a warm temperature and an atmosphere moistened with steam vapor, but the symptoms increased, and towards evening it was manifest that unless more active measures were adopted he would speedily die.

Chloroform was administered, and Mr. Caird opened the trachea immediately above the enlarged isthmus of the thyroid. The ordinary silver tracheotomy tube was inserted with but little or no amelioration of the patient's state, and, acting on the experience of a former case, in which very marked relief was at once afforded by the use of a long india-rubber tube, the following treatment was adopted:—A portion of a large-sized Thompson's india-rubber catheter was passed through the silver canula, and on leaving this and passing into the trachea, the catheter met with a slight resistance, which was easily overcome. It was now almost at once evident that the patient had derived considerable benefit from the longer tube, small though it of necessity was.

On the second day after the operation there was a severe hæmorrhage from a vessel in the thyroid body, and this, after some difficulty, was arrested by the actual cautery.

The silver tube was now withdrawn over the flexible catheter, and then in the place of the latter was introduced a piece of india-rubber tubing about five inches long, and with a bore the size of a No. 8 catheter, for it was feared that the chafing of the metal might induce further hæmorrhage from the cauterised spot, and this, in the patient's already weakened state, must certainly have proved fatal.

The boy's state improved, and at the end of a week the enlargement of the thyroid had quite disappeared.

The india-rubber tube was withdrawn at the end of three weeks, and the wound dressed. By the end of December all symptoms of dyspnoea had disappeared, and, with the exception of a slight hoarseness and being weak, the lad has quite recovered.

#### HOPITAL ST. LOUIS, PARIS.

HERNIA INTO THE ILIAC FOSSA ACCOMPANYING AN OLD INGUINAL HERNIA; AUTOPSY.

(Under the care of M. PÉAN.)

This form of hernia was met with at the autopsy of a patient, not having been diagnosed during life, and its extreme rareness justifies its publication, being only just mentioned by the standard authors.

M. B—, sixty-five years of age, sick nurse, was admitted on Jan. 3rd, with symptoms of

strangulated hernia. She had been affected with this infirmity for seventeen years, but the size of the tumour had considerably increased in the last six months. She had always been able to reduce nearly the whole amount of intestine, but on the eve of her admission into the hospital the hernia had come down more than usual, and she was unable to return it again. She passed an extremely bad night, vomiting all the food she had taken at dinner, and was brought into the ward at eight in the morning.

On entering the hospital the patient was extremely agitated, and complained of strong pains in all the lower part of the abdomen, especially on the left side, which was the seat of the hernia. The skin was slightly distended, and painful upon pressure. Pulse 120; temperature 99.6° F. The tumour extended from the internal extremity of Poupart's ligament to the anterior and inferior spine of the ilium. Its breadth at its internal extremity was two inches, and four inches at its external extremity. M. Péan attempted the reduction of the hernia while the patient was held with her head downwards, but without success. Later in the day the house-surgeon tried while the patient was in a bath, but was not more fortunate.

Jan. 4th.—This morning M. Péan decided upon operating. The woman had vomited fecal matter several times during the night. Pulse 132; temperature 100.4° F. The operation was performed in the usual manner, and the intestines having been put back into the abdomen, the wound was brought together by a metallic suture. The patient expressed herself relieved after the operation, but later in the day the symptoms declared themselves again, and the patient continued to vomit fecal matter.

5th.—The patient had passed a most restless night, having vomited almost continuously. Temperature 102.6° F.; pulse 132. Died at one o'clock in the day.

*Autopsy, forty-five hours after death.*—On examining the wound, a portion of the intestine was found to have dissected its way in between the peritoneum and the aponeurosis of the iliac muscle, and to have lodged itself in the iliac fossa, and in this position it was strangulated by a strip of the mesentery, which had rolled itself round the bowel at the entrance of the sac, and which accounted for the continuance of the symptoms of strangulation after the operation. The two sacs were found to communicate.

#### BRADFORD INFIRMARY.

CASE OF HÆMATEMESIS.

(Under the care of Dr. REGINALD G. ALEXANDER.)

The following record of a severe case of hæmatemesis is interesting as illustrating how much a regular, temperate life will sometimes do for apparently some of the worst cases of cirrhosis of the liver from spirit-drinking.

A. B—, aged thirty-four, a clerk, was admitted into the hospital on Feb. 21st, 1872. The patient states that eighteen years ago he had an attack of rheumatic fever which confined him to the house for three months. Twelve years ago he began to spit blood, and continued to do so for six

months. Fifteen months ago he had inflammation of the liver, and three months ago jaundice. Having been crushed in a crowd eighteen days since, a feeling of great oppression in the region of the stomach followed, accompanied by cold sweats; and during the same evening vomiting of blood in large quantities took place. He also passed blood by the bowels. He has been a very heavy spirit-drinker and smoker, and upon admission had a sallow, blanched, and cachectic aspect. Diastolic murmur at the base of the heart.

Feb. 23rd.—He complains of a sense of fulness in the epigastrium, and passed a copious black motion. Ordered perfect rest and a mixture with digitalis.

24th.—Passed a restless night, and vomited a quart of blood. Ordered thirty minims of solution of morphia, with fifteen grains of tannic acid, every four hours. Small quantities of milk and soda-water, ice to suck, and ice to be applied to the abdomen. At 4 p.m. the pulse was scarcely perceptible, and he appeared to be sinking rapidly. Ordered one ounce of brandy mixture every hour, and a pill with half a grain of morphia and two grains of mercury pill.

25th.—Patient somewhat rallied. Ordered ten grains of gallic acid and ten minims of solution of morphia in an ounce of infusion of roses, every three hours. No food to be taken by the mouth, and only nutritive enemata to be given.

26th.—Vomited eight ounces of blood and passed black motions. The medicine of the 25th to be continued, and no food to be given by the mouth.

27th.—The patient neither vomited nor passed any motion. Ordered half a dozen oranges.

28th.—Motions still black. Pulse 115; temperature 97.2°. Injection stopped and food cautiously given.

29th.—The patient desires a glass of beer; half a pint allowed to be taken in spoonfuls at a time. Pulse 92; temperature 99.2°. Is very restless at night. Ordered six grains of lead with opium pill, two grains of calomel to be taken at bedtime, and a mixture of dilute nitro-hydrochloric acid with infusion of gentian during the day.

March 1st.—The pills of the 29th of February have been continued each night, and have secured ten hours of sleep. The patient is much refreshed, and declares himself to be well. Was discharged cured in ten days from this date, and on the 10th of April he wrote to say that he had had no relapse.

*Remarks.*—This case is one which is often seen at hospitals, the subjects being generally men of very intemperate habits, and the patient's condition on the 24th of February illustrates the state of utter prostration which may follow loss of large quantities of blood without a fatal issue. A few weeks ago (December, 1875) the man was in very good health, and, having changed his habits, the cachectic look he had upon admission into the hospital had entirely disappeared.

#### ROYAL FREE HOSPITAL.

ACUTE URETHRITIS; RETENTION OF URINE; SUPRAPUBIC ASPIRATION; RECOVERY.

(Under the care of Mr. WILLIAM ROSE.)

For the notes we are indebted to Mr. Cecil Curwen, house-surgeon.

T. B——, aged twenty, came to the out-patient's department on January 3rd, at 2.30 p.m., suffering from gonorrhœa, and complaining that he had been unable to pass any water for upwards of twenty-four hours. He first noticed a discharge from urethra about a fortnight before this, and for the last week he had noticed that his stream got gradually smaller, until finally it stopped altogether. The patient at this time was in great pain, constantly straining but passing nothing. A physical examination showed a copious discharge of pus from the urethra, and a bladder that was much distended and prominent, the area of dulness extending nearly up to the umbilicus. Pressure caused great pain. The patient was admitted, and ordered thirty minims of the tincture of opium, to be followed, after a short interval, by a hot bath. After this he passed a few drops of urine but no stream.—4.30: Fears being entertained that his bladder might give way, and it being thought inadvisable to pass a catheter on account of the specific inflammation of the urethra, the fine needle of the aspirator was inserted into the bladder immediately above the pubes, and urine, slightly ammoniacal, to the amount of thirty-eight ounces, was drawn off. Immediate relief followed. Ordered a full dose of castor oil, and to be put on an alkaline and purging treatment. At 9 p.m. he was sleeping.

Jan. 4th.—At 10 a.m. patient complained of great pain, and the bladder was distended, but not so much as before. The patient succeeded in passing a small quantity of water, which relieved him. There was copious discharge from the urethra, and much scalding. At 2.30 the bladder was again aspirated, and thirty-four ounces of urine were drawn off. At 4.30 he was ordered a hot bath, and managed to pass some water in it. At 9 his bowels had been freely opened, and he felt comfortable.

Next day he was able to pass his water, his bladder being seemingly empty. His urethra was still discharging freely. His stream was small, but did not scald so much. On the 6th and 7th he continued to improve, the stream getting larger, and the discharge and scalding less. He continued to take a hot bath night and morning, and was kept on low diet, and freely purged. On the 8th, he passed his water freely, there being no discharge or scalding, and on the 9th a No. 4 silver catheter, followed by a No. 7, was passed without difficulty, and the patient was pronounced convalescent, and fit to be discharged.

## Editorial.

### PHYSIOLOGICAL PSYCHOLOGY.

THERE are few truths that have been more forcibly brought home to us within comparatively modern days than that which declares all mental phenomena to be in great measure dependent on the organisation of the nervous system, as demonstrated by actual experiment. In point of fact, the barriers between physiology and psychology



are fast being destroyed. Day by day the boundaries of a purely mental philosophy are being narrowed by new discoveries in the physiology of the sensory organs, until at length we begin to see clearly the new psychology emerging from behind the metaphysical haze that has concealed it for centuries. It is, then, with no small satisfaction that we notice the appearance of a new quarterly journal in which the claims of physiology as the basis of a large amount of psychology will be fully recognised. Its appearance and prospects of success point also to a much more widespread interest in philosophy than was taken in it even ten years ago. Time was, indeed, when philosophy kept aloof from material and mundane affairs—when it was the chosen life study of a few enthusiasts, each of whom did his best to found a “school of thought” different from that of his predecessor. But it is now aiming at a wider application—in many instances a directly practical and useful one; and a knowledge of its leading principles is becoming, indeed, a necessary part of a higher education. To the physician the study of the mind in health and its dependence upon the normal performance of the corporeal functions is no less interesting than necessary; and to many of our readers doubtless the appearance of such a publication as *Mind* will be welcomed with pleasure, furnished as it is with such a list of contributors as Herbert Spencer, George Henry Lewes, and Professor Bain, and edited by Professor Croom Robertson. We may hope in future numbers to find contributions from some of the leading psychologists among ourselves—as Wilks, Maudsley, Bastian, and Carpenter.

There is one article in the journal before us which deserves especial recognition at our hands. It is entitled “Physiological Psychology in Germany,” and is from the pen of Mr. James Sully, who by his recent work on “Sensation and Intuition” has proved himself to be thoroughly conversant with the recent advances made in the physiology of sensation—notably by Helmholtz—in their application to psychology. In the present article Mr. Sully devotes himself, in the main, to an analysis of Wundt’s great work on the subject of Physiological Psychology—we believe, the first notice of this most important book that has appeared in this country. The name of Wundt as a physiologist is indeed familiar to us, but in his character as a psychologist he is yet but little known, at least in England. Certainly no one can render more service in the elucidation of mental processes than he who has already attained a high position as a physiologist.

It is manifestly in the field of “sensation” that these two hitherto distinct branches of knowledge—physiology and psychology—blend; and it is from the study of the functions of the sensory organs that much light may reasonably be expected

to be thrown upon the higher mental operations. Among the first to work in this direction was the well-known physiologist Johannes Müller, who, in order to explain Kant’s famous metaphysical problem or theory of space, enunciated the doctrine of the “specific energy” of nerve-fibre—a doctrine which, although amplified and extended, has in the main been accepted by physiologists since his day. The term “specific energy” carries its interpretation with it; implying simply that each order of sensory nerve-fibre is primarily modified so that it can only react in one particular way, and that when stimulated it can only call up one special sensation. This doctrine—which really amounts to but little more than a mere restatement of the fact that there are different kinds of sensory organs, with their special nerves, in connexion with the cerebrum—is disputed by Wundt. He denies the existence of any specific energy, whether of the conducting fibres or the recipient nerve-cells in connexion with a sensory organ; and declares them to be alike “functionally indifferent,” just as anatomically no perceptible difference exists between a nerve-fibre or central cell in connexion with the different sensory organs. A similar view was taken by Mr. Lewes several years ago. The arguments adduced by Wundt fall under two heads: first, the difference in the structure and disposition of the terminal organs; and, secondly, the capability possessed by nervous tissue of becoming modified under repeated stimulation of one sort, so that whatever stimulus may subsequently act on it the sensation peculiar to the special stimulus is alone called up. Briefly put, this latter statement is “the extraordinary capacity for self-adaptation to stimuli.” The special structures or terminal organs—fitted to react only to stimuli of one kind transmit to the nerve-centre by means of the fibres the particular excitation in question. Further, the theory of specific energy is incapable of explaining the mechanism by which varying degrees or qualities of sensations of the same sense can be produced. One explanation of this was proffered by Helmholtz, who assigned to separate fibres the function of conveying a separate quality of sensation—as, for example, in his comparison of the organ of Corti to a keyboard, the components of which severally react to vibrations of different wave-lengths. Wundt combats this view mainly on anatomical grounds; and with regard to audition, to quote Mr. Sully’s words, “He maintains, in opposition to Helmholtz, that a simultaneous excitation of two adjacent fibres would result, not in an intermediate tone, but in the two tones answering to the fibres, and that therefore, since our sensations of tone contribute a *continuum*, the hypothesis of definite pitch fibres would require an infinite number of nervous threads.” In short, Wundt believes that the kind of sensation depends on the form of stimulation, and that the reason

why a special sensory nerve *can* only react in a particular way is that because of repeated stimulation by one form of excitement it has its molecular constitution so altered that at last, no matter what form of stimulus be, applied to it, its specific sensation will be aroused. So that the outcome of Wundt's reasoning brings us to much the same point as the hypothesis of specific energy does: it implies that there is a specific and structural adaptation of the various sensory nerve-fibres and their respective ganglionic cells, by which they can only react in a particular way. But the great merit of Wundt lies in the fact that he has attained this end by a different path, and has given an explanation of the causes of variety in sensation which he thinks is the more "conceivable psychologically," and, as Mr. Sully points out, is more in accordance with the doctrines of evolution.

There are other directions, besides this of the qualities of sensation, in which the psychological part of sensation has been materially aided by physiological experiment. The rate of transmission of the nervous impulse, the time taken in the mental process, have been estimated; but more than this, there has been ascertained by actual measurement the amount of sensation which is called forth by a stimulus of a given strength. This quantitative measurement of sensation—I. e., of an actual mental operation—has been so accurately done that it has been possible to deduce therefrom a general law. This was done by Fechner in his now well-known "psycho-physical" law. Based upon the observations of many experimenters, this law starts with the smallest perceptible stimulus required to call up a given sensation. In order to produce an increase in the sensation it is found that the stimulus must be increased in a definite manner, at a constant rate, but different from that of the sensation. Thus, there is a definite relation between the stimulus and the amount of sensation called up by it,—a relation expressed in the law "that sensations increase in proportion to the logarithms of the intensity of excitation." At present the law has not been applied to the senses of taste and smell, and, with regard to the other senses, it only holds good within certain limits. Hence it cannot be regarded as final, and it is possible that it may require some modification before it will stand every test. As it stands, however, it is a striking example of scientific generalisation.

We have no space to follow Mr. Sully through his lucid exposition of Professor Wundt's views on the more strictly psychological subject of "Attention," in which, however, physiology is introduced in support. Enough is recorded in the article to show how much, and how little, is yet known in this comparatively unexplored domain of "physiological psychology."

## THE FUNCTIONS OF THE COLON.

THE capacity possessed by the colon for absorbing and digesting food introduced in it, is a problem of much interest for physiologists, but of still greater importance to physicians. The degree to which it may be trusted as a means of introducing food into the system is of vast importance in the treatment of disease. Great confidence is at present placed in its digestive and absorptive powers. How far the confidence is justified is a matter of some doubt. The researches on the subject which have hitherto been made have been indecisive; and a recent very important addition to the experimental facts at our disposal, which has been made by Dr. Marckwald, of Heidelberg, does not put the matter altogether at rest. The conditions under which his investigation was made were unusually favorable, and the observations conducted with such accuracy that they deserve careful notice.

The researches, which are described at length in a recent number of Virchow's *Archiv*, were made upon a man in whom, in consequence of the sloughing of the anterior wall of a cæcal hernia, and from the operation to relieve his hernia, a large cæcal fistula resulted. A large portion of the posterior wall of the cæcum had become extruded from the wound in the form of an oval tumour 5 in. long and 2½ in. broad. In it three openings could be found, one of which communicated with the small intestine, one with the vermiform appendix, and one with the ascending colon. Thus the colon was completely isolated and perfectly accessible, so that its whole length could be conveniently employed for the purposes of experiment. The previous observations which have been made in similar circumstances are open to the objection that the intestine was not perfectly isolated, or that only a small portion of the intestine was available for observation, in many cases only the lower end of the intestine. Hence the results of the experiments have hitherto given a very imperfect representation of the normal process of digestion. The secretion of the large intestine is slowly formed, and food, if it is to be digested at all, must be brought in contact with different portions of the intestine to obtain the full effect. Further, the higher part of the intestine contains more glands, and so offers a more favorable subject for experiment.

The three chief questions to be answered were—first, Does the large intestine secrete a substance capable of transforming starch into sugar? Secondly, Has its secretion a digestive action on albuminous bodies? Thirdly, Does any absorption of nutritive substances take place from the colon; and, if so, in what condition must they be? The investigations on the formation of sugar, and

the experiments on digestion, were made in two ways: partly with secretion from the intestine obtained from the fistulous opening of the colon, and kept at a certain temperature; partly by the introduction of those substances into the intestine. For the observations on the transformation of starch, new potato-starch was employed; for the experiments in digestion, raw fibrin treated with alcohol, and also coagulated albumen. The observations on the absorptive power of the intestine were made with water, liquid white-of-egg, and peptone solutions. Between each experiment the intestine was allowed a thorough rest.

The question of the transformation of starch was quickly settled in the negative. Neither in the body nor out of it did the secretion transform starch into sugar. It was therefore clear that no ferment capable of doing this is present in the human colon. A much less expected negative was the result of the experiments on digestion. No effect was produced on fibrin or coagulated albumen by their maceration in the secretion of the colon. Nevertheless, when these substances were introduced into the intestine, an examination of the *fæces* showed that although most of the albuminous constituents were unchanged, yet a certain proportion had been transformed into peptones. It was thought probable, however, that these peptones had been formed rather by a process of decomposition than of true digestion. The residue had a putrid smell, and contained vibriones; and, moreover, this change was only found when the substances had remained in the intestine for twenty-four hours or more. A small quantity of nitrogen disappears in the transmission of the albumen &c. through the intestine; and this has led some previous observers, who had ascertained the same fact, to infer that digestion occurred. In the opinion of Marckwald, it is to be ascribed only to putrefactive changes.

The important question remains, however: How far does the mucous membrane of the colon possess the power of absorbing liquid substances introduced into it which require no digestive process for their solution? Preliminary observations were made on the absorption of water; afterwards the absorption of peptones was tested, and lastly that of fluid albumen. The absorption of nitrogenised substances was estimated by the quantity of nitrogen eliminated in the urine. The observations on the absorption of water were attended with much difficulty, since the water unabsorbed after a given time could not be collected. The conclusion from the experiments was that the absorption of water takes place very gradually, and for the absorption of half a pint of water at least twelve hours are needed, and probably more. The experiments on the digestion of albumen had shown that a small increase of nitrogen in the urine followed the decomposition of albuminous bodies. This was con-

sidered a proof of the absorption of some of the peptone thus formed. How far is a quantity of ready-formed peptone absorbed? A carefully prepared peptone proved in large quantity very irritating to the intestine, producing such a degree of irritation as to effectually prevent its absorption. Half a pint of peptone solution did not in the slightest degree augment the amount of nitrogen secreted by the urine. Voit and other observers had found, by experiments on dogs, that the absorption of fluid albumen from the colon did not occur unless common salt had been added to it. Czerny and Latschenberger, from experiments on man, have recently come to the conclusion that fluid albumen may be absorbed without the addition of salt, which rather hindered than facilitated the process. Dr. Marckwald's observations, which were unfortunately limited to four, failed to get any evidence of the absorption of albumen, with or without the addition of salt. In no instance did he find evidence, by an increase of nitrogen in the urine, of any absorption from the intestine. He concludes, then, that, under all circumstances, absorption from the colon is a very slow process, and is confined to water and a small amount of peptone, especially when the latter is slowly formed in the intestine itself. He points out further that these conclusions receive indirect corroboration from the well-nourished state of patients in whom, as in the subject of his experiments, the mucous membrane of the colon is, by an artificial anus, withdrawn from the absorbing surface of the alimentary tract.

It cannot be considered that these experiments, important as they are, decide the questions at issue. The daily clinical experience of the value of nutritive enemata, if not reduced to clear and unchallengeable data, is very strong, and is certainly opposed to the conclusion drawn from Dr. Marckwald's observations. Moreover, these conclusions are in opposition, it must also be remembered, to the observations of almost all previous experimenters, some of which, as those of Steinhäuser, were made under conditions closely analogous. It is clear that more observations are needed before the question can be considered at rest. Opportunities for such observations occur rarely, but it is important that they should be seized whenever they do present themselves, and perhaps no better mode of investigation can be adopted than that followed by Dr. Marckwald.

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A PLEASANT WAY OF TAKING CASTOR OIL.—Mix ten grains of powdered tragacanth with two drachms and a half of water; upon this pour very slowly, drop by drop, half an ounce of castor oil, stirring constantly with the pestle. When the mixture is complete, add about three ounces of water, an ounce of syrup, and a few drops of laurel-water. In this manner a white emulsion is obtained, in which the taste of the castor oil is (according to the *Paris Médicale*) quite masked, and replaced by the perfume of the laurel-water.

# Medical Annotations.

"Ne quid nimis."

## PIGMENTARY DEPOSITS IN THE BRAIN FROM MALARIAL POISONING.

DR. W. A. HAMMOND has recently called attention to this subject in connexion with some interesting and novel observations and experiments of his own. It is universally recognised that malaria is capable of making a profound impression on the nervous systems of those upon whom its toxic influence is exerted, and it has also been observed that there is a disposition engendered in such subjects to the production and development of pigmentary deposits. There is very frequently a peculiar bronzing accompanying the anæmia of paludal cachexia, not only observable on the skin of the exposed and uncovered parts, but of the covered parts of the body; and, what is more, this pigmented staining is frequently present in the internal organs and tissues. According to Virchow, Dr. Stiebel was the first to notice the occurrence of pigment-cells in the blood, and Meckel, Virchow, and others, have discovered numerous pigment-cells in that fluid in connexion with malarial poisoning and hypertrophy of the spleen; and previous to their observations the fact of pigment existing abnormally in various organs of the body had been noticed. In 1831, Bright described and figured the brain of a man who had died from cerebral paralysis, which appeared to have resulted from an attack of fever. The cortical substance was of a dark color, like black-lead. The spleen, liver, and the tissues of other organs have also been found similarly affected. Dr. Hammond had a patient in 1874, suffering from deafness, pains in the head, and epileptic convulsions, in whom an ophthalmoscopic examination showed the existence of double optic neuritis, with pigmentary deposits. There was a history of malarious fever in the case, and recovery from these symptoms, including the deafness, followed the use of arsenic. In this and some other cases Dr. Hammond punctured the spleen with a hypodermic syringe, and submitted the blood drawn off to microscopical examination with the result of finding in it numerous masses of free pigment, irregular in form, and varying in size from the 1-1000 to the 1-300 of an inch.

As a result of these observations and of some experiments on the lower animals, in which he injected finely-powdered indigo into the circulation, Dr. Hammond, after a consideration of the whole subject, is led to conclude: that, as a consequence of malarial poisoning, the pigment of the blood undergoes a change in appearance and form, and that the alteration is effected in the spleen, leading to hypertrophy of this organ; that this pigment may enter the general circulation from the spleen, either in a free condition or in pigment-holding cells, and that it may be deposited in the cerebral bloodvessels or pass through their coats; that these deposits may give rise to various symptoms indicating derangement of the nervous system; that arsenic appears to have the power, in a way at present unknown, of so altering the character of the pigmentary deposits as to facili-

tate their removal, and to cause the disappearance of the symptoms to which they give rise: and, lastly, that we may have, during the life of the individual, ocular demonstration of these facts by the presence of pigment in the fundus of the eye, as revealed by the ophthalmoscope.

## THE CAUSE OF THE COMMENCEMENT OF PARTURITION.

In a paper on the above subject Dr. C. M. Crombie has discussed some of the forces which play a part in the process of labour. He maintains that labour is not the result of a new impulse suddenly communicated to the uterus at term, but the completion of action which began when conception took place. He holds that the uterus in the human, as well as in other animals, is a part of the oviduct, but greatly modified; that the primary function of the oviduct is the discharge of the egg, and retention and development of it only secondary; and further, that there is nothing to distinguish the uterus from the rest of the oviduct, except the protracted continuance of its function. The evidence of activity of the uterus during gestation is derived from several sources. The great muscular development of the organ points to it, for it is contrary to physiological and pathological laws that a muscular organ should grow while completely at rest. The phenomena of abortion and premature labour, and the possibility of inducing premature labour; the sensations referred to the quickening of the child, which are believed to be due mainly to the movements of the uterus; the gradual approach of the actual process of labour—all lead to the inference that the uterus is active during the whole period of gestation. Moreover, the contractions of the organ have been actually observed in the course of pregnancy, occurring regularly and alternating with expansion. Though the uterus struggles from the first to expel its contents, it fails to do so until the reduction or withdrawal of the conditions that during gestation prevent the activity of the organ taking effect. These conditions are the attachment of the ovum to the uterus, the condition of the cervix uteri, and the relation of the liquor amnii to the foetus. The latter fluid, though increased in quantity, yet relatively to the foetus is diminished towards the end of pregnancy, and, after labour has really set in, becomes discharged; then the uterus acts at an advantage, and expels the foetus. Dr. Crombie has endeavored to explain the process of labour on ordinary physiological principles, and his paper is deserving of a careful perusal.

## SYPHILITIC AFFECTION OF THE SUBLINGUAL GLAND.

M. FOURNIER, the eminent Paris syphilographer, has submitted to the Surgical Society the case of a man, aged thirty, who presented a tumour of the floor of the mouth, which interfered with mastication and articulation. The patient had been treated by M. Fournier eleven years previously for an infecting chancre, and this led to the suspicion that the enlargement of the gland might be due to syphilis. A specific treatment was at once begun, and the swelling rapidly disappeared. Some exception was taken to M. Fournier's diagnosis by

several members; but M. Verneuil, who had to report on the paper, observed that the case was important, as syphilis was supposed to spare salivary glands, the mammae, the ovaries, the thyroid gland, &c. He considered that more stress ought to be laid on the chronicity and appearance of the neoplasm than on the syphilitic antecedents, and that the rapid effects of the iodide of potassium were quite conclusive as to the nature of the tumour.

#### TRACTION ON LIGATURES.

M. BOECKEL, of Strasburg, has published an article in the *Bull. de Thérap.* (Dec. 15th, 1875), on the well-known system of continuous traction in the treatment of fractures, white swelling of the knee, &c. He is a great advocate of this mode of treatment in appropriate cases, and throws out the hint that it might be used with advantage to get rid of ligatures which are too long in coming away. The author considers that, as early as the eighth day, means should be used to detach the ligature, and he advises to tie a string to the latter, and to connect with it a weight of between one and three ounces. In this way he succeeded, in about twelve hours, with ligatures of the carotid and other large vessels. He holds that in a few days, when the ligature is not interfered with, it is reduced to a mere loop, which no longer exercises any constriction. If this were quite true, the least traction with the hand should carry it away. M. Boeckel closes by saying that continuous traction of ligatures should, as a rule, be begun after the eighth day as long as catgut, acu- or forci-pressure (and he might have said torsion) have not abolished the use of ligatures altogether.

#### THE SPINAL GANGLIA.

M. RANVIER has been investigating the histology of the ganglia in the posterior roots of the spinal nerves. These ganglia contain cells to which nerve-fibres pass and from which nerve-fibres proceed. It has been supposed that the same fibres coming from the cord traversed the cells, and at their exit from the ganglion were united to the fibres of the nerve-root, and passed with them to the periphery of the organism. But, according to M. Ranvier, this is not so. The filaments which come from the cord return to it after having become connected with (*touché*) the ganglion cells. Those which pass on to the nerve arise from these cells. Thus, according to him, the posterior root has two origins—one from the cord, and the other from the ganglia.

#### INTERNAL URETHROTOMY.

This is especially applicable in resilient narrowing; but the tendency in modern times has been to search for stricture whenever some uneasiness is experienced about the urethra. The bougie à boule, or more recently Dr. Otis's bulbs, are used in order to discover the spot. It may so happen that the stricture lies near the meatus, and is connected with a band not tight enough to interfere with proper micturition. But in a case reported by Dr. Chamberlain in the *Medical Record* of New York (Dec. 25th, 1875), this state of urethra gave rise to nervous symptoms of a very distress-

ing kind. The stricture having been made out by Dr. Otis's bulbs, it was divided in the usual manner; the nervous trouble at once ceased, and did not reappear.

### News Items, Medical Facts, &c.

At a late meeting of the New York Medical Society a paper was read by Dr. E. L. Keyes, "On the Effects produced upon the Blood of Syphilitic Patients by Treatment with Mercury." The results obtained by investigation mainly corroborated what had been noted by European physicians. In brief it was found that, in syphilis, mercury, in small doses, continued for a short or long period, increase the number of red blood-corpuscles and maintains a high standard of the same. It decreases the number of the red cells when given in excess, especially in hospital patients. Generally, mercury, in small doses, acts as a tonic, and increases the weight of the body. In the discussion which ensued after the reading of the paper, Dr. Bumstead (a distinguished authority) deprecated the steady and long-continued use of mercury in syphilis; in his hands it had proved very unsatisfactory. The plan of treatment which he now adopts consists in the vigorous use of mercury for limited periods of time, and then the allowance of an interval, during which no remedy is taken. After a certain length of time, variable in different cases, a return is made to the mercury, when it is again pushed strongly. He greatly prefers this mode to the prolonged use of mercurials in small doses as recommended by so many writers on the subject. Dr. Taylor also believed that, in order to obtain the best effect of mercury in the treatment of syphilis, it should be omitted for a certain length of time and then resumed.

SURGEON-MAJOR THEOBALD RINGER, M.D., reports a curious case of incessant hiccough in the *Indian Medical Gazette* for December 1st. The patient, a native trooper, was admitted into hospital for a severe attack of secondary syphilis (rupia), and treated with the bichloride of mercury. At the end of five weeks he was seized with hiccough, which continued with little cessation for five days, in spite of the exhibition of chloroform, hydrate of chloral, sinapisms, subcutaneous injections of morphia under intercostal muscles, belladonna plaster to epigastrium, and calomel, in one large dose. On the sixth day a blister was applied to the origin of the phrenic nerve, and he was given extreme doses of iodide of potassium every six hours, and a full dose of quinine once a day, with iced soda water to drink. This treatment was carried on for eight days, the hiccough becoming daily less frequent, until on the tenth day it entirely stopped. The dose of iodide of potassium was gradually reduced as improvement took place, and on the twenty-third day the man was "discharged to duty."

An unusual case of displacement of the liver was recently treated in the Bellevue Hospital, New York. The patient was a man of forty-two, who had no history of specific disease; a temperate liver, and had not been subject to any of the causes which favor displacement of the organ. On admission he was troubled with piles, with frequent desire to defecate. Soon after he suffered from ascites and jaundice, which, after a time, disappeared. The abdomen, in addition to the fluid, contained a solid body, sharp in outline at its lowest border, which could be moved about easily. Percussion and other modes of examination left no room to doubt that it was the liver "dislocated" about three inches. At one time its free border had nearly reached the umbilicus. The mass could easily be restored to the normal position of the liver, but returned as soon as the mechanical support was removed.

PRINTED AND PUBLISHED BY

WM. C. HERALD, No. 52 JOHN ST., NEW YORK.

# THE LANCET.

A Journal of British and Foreign Medicine, Physiology, Surgery,  
Chemistry, Criticism, Literature, and News.

JAMES G. WAKLEY, M.D., M.R.C.S., EDITOR.

PUBLISHED MONTHLY.

No. 5.

NEW YORK, MAY, 1876.

## Lectures

ON

### INDIVIDUAL HYGIENE.

*Delivered at St. Bartholomew's Hospital,*

By REGINALD SOUTHEY, M.D., F.R.C.P.,

Physician to, and Lecturer on Forensic Medicine and Hygiene  
at the Hospital.

#### LECTURE II.

THE constitution each individual possesses consists of various qualities. Certain of these are the outcome of the construction of the body; some are inherited, others are acquired.

There are the qualities which resist decay, which some philosophers, without thereby advancing our knowledge of them one whit, have called "vital energies"; and there are the qualities which invite decay, which medical men usually designate "the proclivities to disease or to degeneration." The latter are full of interest to the hygienist.

I shall occupy your attention to-day with the subject of Temperament, Idiosyncrasy, and Diathesis, pointing out the special morbid imminences or tendencies associated with them; and I shall do the same thing with Age, with Sex, with Habit of body (*habitude*).

Temperament is that structural conformation of body and mind which no change of habits or surroundings (*conditiones vitæ*) can alter. Idiosyncrasy is that disposition of body and mind together which is altered by age and habit and external surrounding, but which characterises each individual son of Adam.

Temperament is built in a man as bricks compose a wall. His idiosyncrasy is developed in him according to the soil in which he is planted, the conditions under which he grows, and the tendency inherent in him to vary.

Temperament is the principle in the constitution which resists change—the race attribute. Idiosyncrasy the individual attribute; the particular variation that still characterises or stamps the man.

Bégin called temperament "*la variété organique*

(13)

*la plus générale*"; and idiosyncrasy, "*celle qui est plus restreinte*." He distinguishes three temperaments. They are the surviving evidence of original ethnic varieties of mankind: the sanguine, the nervous, and the lymphatic; and are quite worth your careful study. The description of them I have taken in the main from M. Lévy's\* excellent account of them.

*The sanguine temperament.*—The head is small in comparison with the body, the face square, the forehead flat, and often sloped rather backwards; the height of the male varies from 5 ft. 7 in. to 5 ft. 10 in., that of the female from 5 ft. 2 in. to 5 ft. 7 in.; the thorax is long, deep, and well vaulted, with a mean average 85 in. girth; the epigastrium sinks in, and when the individual stands upright the umbilicus does not protrude beyond the perpendicular let fall from the xiphoid cartilage, at least, it should not while the man is still under thirty-five years of age.

The sanguineous present no tendency to obesity; their color is fresh, but need not be florid. Their hair is usually light or light-brown and curly; their complexions are clear; they have a firm, tight skin, through which the well-developed muscles stand out; they present the full, firm pulses of vigorous hearts, and the large lung-room which accompanies great bodily activity.

They are hale, rich-blooded individuals, who build up abundantly and eliminate abundantly, maintaining nothing about themselves which they ought to excrete; they may be said to cast off their worn-out tissues as they do their external clothes; their teeth have a slight yellow tinge which appoints a dense, tough, enduring dentine tissue.

Great eaters and drinkers belong generally to the sanguine temperament, with a muscular idiosyncrasy.

The sanguineous fulfil all the functions of organic life with ease to themselves. Their circulations are well maintained; they breathe amply, digest and assimilate their meals quickly and perfectly, and their brain functions appear as easily performed as their visceral. They have lively perceptive faculties, evince an ordinary amount of common sense in their social transactions, and are possessed of just sufficient emotional control to

\* Michel Lévy: *Traité d'Hygiène*.

avoid wounding the not very thin skin of society. They are natural athletes, the easy winners of games in which strength and accuracy of eye are required. They are merry companions, thorough good fellows, whose words flow as easily as their thoughts, as a rule without much profoundness, but with a certain facility of expression. They are courageous because conscious in every fibre of their own strength. Unfortunately, they are difficult to fix at any regular work, needing plenty of change and exercise to maintain their good spirits. They are bad stay-at-home people, and fickle in their affections; love with them is an indulgence of the hour, because the sense of duty and obligations does not abide in thorough corporeal self-satisfaction.

Individuals of the sanguineous temperament are prone to inflammations, pleuritis, gout, acute fevers, hæmorrhages, diseases of the heart and bloodvessels, aneurisms, apoplexy. What have been called crises characterise their febrile disorders. Thus, in erysipelas, pleurisy, pneumonia, you will observe that these persons experience sudden critical losses of fluid, either by spontaneous diarrhoea, profuse sweating, or excessive urination, and by this are at once despoiled of their fever. Their convalescences are thus proverbially rapid.

To sum up, this temperament is beholden to a good machine, and one which fulfils all its functions well up to middle life. It should be selected for soldiers, sailors, and travellers.

*The Nervous temperament.*—The individual stands rather below middle stature, the male measuring from 5 ft. 5 in. to 5 ft. 8 in. The body is slim up to thirty-five, and usually slightly built, the limbs delicately proportioned; the female specimens are relatively taller than the males, but then the feminine examples of this pure temperament are comparatively rare. The head is large for the body, and the brain-case disproportioned to the size of the face. I do not wish you to conclude that a great rickety forehead stamps this type of being. The purest specimens are furnished by Hungary and Corsica, I believe, but you will meet examples all over Europe. The complexion is pale and generally sallow, the eyes are dark, the hair black and coarse, the features are mobile, and the expression earnest. The skin is prone to pigmentation in all its wonted sites; it feels habitually too hot to one's touch, a sensation merely due to its dryness and inelasticity. The muscles are sparsely developed but firm. The movements are highly characteristic of this temperament, being always hasty and jerking; their gait and hand-writings show this lack of nervous co-ordination.

The evident lack of accord between the nerve-centres and the muscular apparatus may be due, perhaps, to cerebro-central preoccupation, some slow appreciation of the wants of more distant parts; hence in all games which require what is called a quick eye they seldom attain excellence. The circulation of the blood is not equably maintained in them; they either present heads too hot and extremities too cold, or complain of their hands and feet burning while their heads and trunks are cold; they digest badly, suffer with flatulence and constipation, and diarrhoea and colic alternately; their excreta are highly offensive, and the axillary odor in them, especially when they

are sick, is particularly disagreeable and strongly phosphatic.

One prominent feature of nervous temperaments is the increased activity of the sexual instinct, another is the very little control over their passions which they exhibit; the emotional part of their natures is always at high concert-pitch, while their judgment powers are only kept in tune at all by being constantly engaged and looked after; the sense of right and wrong is very keen in them, but the practice of right is felt to be very difficult.

The physician knows this temperament well, less by the particular maladies to which it is prone than by its peculiar reaction with all disease, towards which the faculty of resistance appears about commensurate with the will of the individual. There is no happy mean with them—they either lie in the uttermost depths of depression or are exalted upon the highest pinnacles of pleasure. The periodicities of disease are well marked in them; they get well of wounds and acute affections which they might be expected to die of, and die of complaints that other natures recover from. They are prone to migraine (sick-headache), neuralgia, erysipelas, pneumonia, tuberculosis, insanity. Throughout life they are fidgety, uncomfortable beings, who chafe and fret with their harness, and are singularly intolerant of persons of the same temperament and faults as they possess themselves; they feel pain acutely, resist opposition bitterly. Whereas the other temperaments tone down as life progresses, the peculiarities of the nervous become only more pronounced with advancing years. As previously indicated, the typical exemplars of this temperament are discovered only in the male sex, in men of great genius and possessed of singular energy, but who, unfortunately for society, are very vindictive and rather careless about *meum* and *tuum*. This temperament furnishes the world with poets, artists, musicians, and fanatics.

*The Lymphatic temperament.*—Typical individuals of the lymphatic temperament are heavily framed; their heads are large, and their skeletons are of a somewhat clumsy build. This clumsiness is due to the thickness of the epiphyses of the long bones; the wrists and ankles are thick, and all the joints are unduly large and prominent. These persons are not well-proportioned according to artists' rules of beauty. The males in Europe measure generally between 5 ft. 8 in. and 6 ft. 2 in. in height; the females between 5 ft. 5 in. and 5 ft. 9 in. (Let me here remark, however, that although temperament is pandemic, height is greatly influenced by climate and surroundings. The inhabitants of mountainous districts are usually taller than those of seaports or wide valleys).

They have soft white skins, fair, but not transparent complexions; light eyes, blue or grey; white, blonde, or, gold-chenut hair, which is very fine, and generally very abundant in all its habitual sites. Their muscles are loose, flabby, and relatively small; their lips pale-colored and rather thick; their features are large, and their expressions heavy or apathetic; their teeth are either opaque white or are like blue-white china. The accession of puberty is late with them; they are slow thinkers, and, until roused, hesitating speakers; but their memories are good, their reasoning powers are considerable, and their judgment sound and logical. Common sense and straightforward



conduct characterise them in their dealings with their fellow-creatures. Socially they are seldom the best company, but their sterling qualities make them the best friends. It is impossible to regard typical specimens of the lymphatic temperament otherwise than as a delicate breed. The Xanthochroi, of whom Prof. Huxley wrote in his article on British Ethnology, have been a conquering and over-running race, but they are short-lived, and have elements of inherent debility about them, and their success is certainly less due to their bodily than their valuable mental qualities. The constructive fault in them appears to be a too redundant vegetative cell-life, a capacity and a proclivity to combine and appropriate more water than is requisite for the perfect nutrition of their tissues, the error being an increase in the size of parts rather than their solidity.

All observers are agreed that this is the least adaptable temperament, the one that suffers most rapid and most complete injury when exposed to any anti-hygienic conditions of life; it certainly offers the largest number of deaths to mortality returns under the headings of scrofula, phthisis, and rheumatism.

Temperaments cross freely with each other, but do not blend much. Were I to occupy your attention with what are called the compound temperaments, the lympho-sanguineous and the nervo-lymphatic, common enough in England although these two *temperamenta temperata* are, I believe I should fritter away the chief distinctive features which I have desired to impress upon you. Sons, according to an observed law of inheritance, usually inherit the temperament of their mother's father, and daughters that of their father's mother, the same types reappearing with all their correlated qualities of form and feature and mental temper very little neutralised or altered.

The nervous temperament blends least of all, or transmits itself prepotently; the sanguineous and lymphatic are more often found combined, but then in the most perfect cross you will recognise a prevalence of the lymphatic element in childhood and old age, of the sanguineous in youth and manhood, of the nervous in earliest infancy and after middle life.

Temperament, as I have already advanced, is an innate race attribute, more or less well marked in most individuals, which is well worth recognising, less for any special proclivities to disease which it appoints than for the reaction of the individual with disease which it certainly assists us in forecasting.

A man's idiosyncrasy is the particular disposition of his body which prevails in him, but which takes moment from some predominating organic energy within him. Different systems of organs thus spring up into activity at different periods of life, and the organ temporarily most active signalises its supremacy by exercising the widest influence throughout the body. In infancy, the gastrointestinal system reigns thus supreme; in childhood, the cerebral; in youth, the muscular; in manhood, the sexual; in middle-age, the cerebral rules again; and in old age, the gastro-intestinal.

Now idiosyncrasy may be vouchsafed to connote morbid imminences very importantly. The organs in greatest functional are those also that are

in highest vegetative activity; they therefore resent maltreatment especially, and suffer injury from bad nutrition or insufficient supplies of aliment, or mal-hygiene—to use one comprehensive word. If there be any general disease, those parts will proclaim it by their speedy and profound malfunctioning.

Let there be any febrile disturbance in infancy, then vomiting and diarrhoea will most likely attend it; similarly in childhood, delirium, restlessness, perturbation of the nervous system, convulsions, may be expected; in youth, rheumatisms, heart and lung complaints, affections of the blood and blood-making glands; in manhood, affections of the sexual apparatus; in middle-age look out again for disorders of the brain and cerebro-spinal system, and of the blood-purifying glands, for these will be taxed to their utmost in removing the waste; in old age anticipate abdominal disturbances.

I find many authors employ "idiosyncrasy" and "diathesis" as if these were synonyms, but should advise you not to do so. Reserve "idiosyncrasy" for the particular individual disposition of body which is impressed by certain vegetative functions asserting undue supremacy (the brain, the stomach, and the sexual organs each do this at different periods of life); but use "diathesis" to signify morbid dispositions only, such as the hæmorrhagic, the scrofulous, the gouty, the heteroplastic, under which last I include both tubercle and cancer. About diathesis I need say no more; this belongs to the province of the lecturers on medicine.

### LECTURE III.

Age is the subject I take next. You have to learn the features that appoint it, in order to compare the age any individual confesses to with the actual appearance he presents and evidence of degeneration he affords. At thirty years you will meet with persons in our own climate who are really old, and others at sixty-five who are nearly as vigorous as formerly at thirty-five; indeed, you will observe that the children of the same parents, living apparently under identical conditions, age sometimes quite differently.

Human life may be more conveniently divided by the changes which the body undergoes in growth and development than by terms of days or years. Still it is for you to know what is timely and untimely; and that the corporeal alterations which, as a rule, do coincide pretty closely with particular ages, also entail special morbid imminences. A man's body is like his clothing; it wears out in certain places first, not all together. Some organs degenerate from under-employment—brain and muscle, for instance; others from usure—lungs and bloodvessels. Growth is not constant, nor development regular. The body makes periodical shoots, as trees throw out buds and branches; and these periods of activity are seasons when disease is either invited or thrown off or diverted in new directions. Thus the pathologist speaks of the diseases of foetal life; of infancy; of those incident to first and second dentition; of adolescence; of maturity; of decadence; of old age; of decrepitude.

In order that you may compare facts with

figures, I have hung up two tables: a table of ages, and a table of expectations of sickness.

#### Ages.

|             |     |     |                        |     |
|-------------|-----|-----|------------------------|-----|
| Babyhood    | ... | ... | from birth to year 1.  | 1.  |
| Infancy     | ... | ... | from year 1 to year 7. | 7.  |
| Childhood   | ... | ... | " 7                    | 14. |
| Adolescence | ... | ... | " 14                   | 21. |
| Maturity    | ... | ... | " 21                   | 49. |
| Middle age  | ... | ... | " 49                   | 63. |
| Old age     | ... | ... | " 63                   | 77. |
| Decrepitude | ... | ... | " 77                   | 84. |

#### Expectation of Sickness.

|            |                    |          |              |
|------------|--------------------|----------|--------------|
| At 20      | years calculate on | 4        | days yearly. |
| " 30 to 30 | "                  | 5 or 6   | "            |
| " 45       | "                  | 7        | "            |
| " 50       | "                  | 9 or 10  | "            |
| " 55       | "                  | 12 or 18 | "            |
| " 60       | "                  | 16       | "            |
| " 65       | "                  | 31       | "            |
| " 70       | "                  | 74       | "            |

Hippocrates was wise enough not to pretend to give any estimate for the period between babyhood and maturity, or for that after seventy, and all he intends by sickness is incapacity to labor, to pursue ordinary avocations.

A few words about the diseases of *infancy*. I cannot pretend to give you a list of them; I hardly think it would be profitable; but some physiological explanation of them may be. There is a laxity of all the cellular tissues and an extreme vascularity, which appoints the morbid proclivities of this age. The serum of the blood transudes the walls of the capillaries upon very slight provocation, hence local dropsies, mucous or catarrhal fluxes, diarrhoea, bronchitis, are especially prone to occur. If the hæmorrhagic diathesis exist, this will be nearly sure to betray itself within the first year of life. The great fatality of laryngeal catarrh between the third and sixth month of babyhood, of dropsy after scarlet fever under five years of age, of diarrhoea, bronchitis, and whooping-cough between two and seven, has its explanation in this physiological phenomenon.

Thrush and stomatitis are epiphenomena to all states of malnutrition and febricula in infancy and early childhood between one and ten.

Dentition is no disease, but first dentition is a time when the body is specially prone to disorder, since it is a great local change which takes place in a comparatively short period. Vogel divides *first dentition* into five periods:

- 1st. Between the 4th and 7th month: the 2 inferior incisors pierce the gum, attended by about 8 days' febrile disturbance; then ensues a pause of between 8 and 9 weeks.
- 2nd. Between the 8th and 10th month: 2 superior incisors and 2 superior lateral incisors, attended by little disturbance, followed by a pause of from 6 to 12 weeks' duration.
- 3rd. Between 12th and 15th month, consisting of 6 teeth: 2 molars in upper jaw, 2 lateral incisors in under, 2 molars in under jaw, attended by 6 to 8 weeks' febrile disturbance, followed by a pause of 8 to 12 weeks.
- 4th. Between 18th and 24th month, consisting of 4 teeth: 2 upper eye-teeth, 2 lower eye-teeth, attended by scarcely any disturbance, followed by a pause of 6 months.

5th. Between 30th and 36th month, consisting of 4 teeth: 2 lower molars, 2 upper molars.

This completes the twenty so-called milk-teeth; then between the sixth and seventh year the third molars of the first set, or anterior molars of the second set, or permanent teeth, appear, a period when most mothers and nurses admit that children exhibit their individual peculiarities of temper in a marked manner.

I will only add this much more about infancy and early childhood, that convulsions are very common up to seven years, that pneumonia is rare under five, that tubercular meningitis is most common between five and eleven. Between the fifth and seventh year of childhood the arteries of the milk-teeth obliterate and the nerves degenerate, the roots and alveoli are absorbed, and the teeth fall out very much in the order in which they came.

The *second dentition*, as Hunter first pointed out at p. 82 of his work on the Teeth, does not proceed regularly from the first incisor backwards, but begins at two points on each side of both jaws, at the first incisor and at the first molars. But for the second dentition, as for the first, let me refer you to the facts which I have arranged in tabular order.

|              |                                |
|--------------|--------------------------------|
| At 7 years,* | the 4 anterior molars are cut. |
| " 8          | " " 4 central incisors.        |
| " 9          | " " 4 lateral incisors.        |
| " 10         | " " 4 anterior bicuspidæ.      |
| " 11         | " " 4 posterior bicuspidæ.     |
| " 12 to 12½  | " " 4 canines.                 |
| " 12½ to 14  | " " 4 posterior molars.        |
| " 18 to 20,  | " " 4 wise teeth.              |

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At or about the age of fourteen most observers admit that nervous disorders, especially those of a choreic and epileptiform character, are prone to exhibit themselves, just when the posterior molars are cut, and the anterior molars are crowded and often, too, decaying. These affections of the cerebral centres are sometimes referred to the sexual organs, whose developmental nosis is supposed to predominate at this age in girls; both boys and girls, however, of the nervous temperament are pretty indifferently affected with identical motor nerve disorders at the same age.

Lebert's table shows that while scrofulous diseases range between the ages of one and fifty, the maximum amount occur between the ages of ten and fifteen. Typhoid fever is most prevalent between nine and fourteen, and again between fifteen and twenty and twenty and thirty; Murchison's tables showing the largest percentage of cases between fifteen and twenty. Half of all the cases of stone are presented in children under puberty. The diseases which especially belong to adolescence are the eruptive fevers, typhoid fever, epilepsy, rheumatism; those to which maturity is most prone derive their moment from the sexual organs, from local congestions provoked by exposure, privations, alcohol, careless clothing, improper feeding, and unhealthy occupations. Rheumatism is most prevalent between fifteen and thirty-five.

Hospital statistics exhibit the diseases incident to

\* The approximate age only is given: thus the four anterior molars usually appear in the sixth year, but nearer to the seventh than the sixth birthday. The teeth of the lower jaw usually precede those of the upper by one or two months.

maturity in a perfectly different ratio if collected from in- or out-patient lists exclusively. The venereal affections, bronchial catarrhs, chronic diseases of heart, lungs, stomach, liver, and kidneys, are treated as out-patients. The acute inflammations, rheumatisms, pneumonia, pleurisies, hæmorrhages, &c., are admitted into the wards.

*Middle age*, from forty-nine to sixty-three, is pre-eminently the period for new growths, the development of tumours and cancers. The active inflammatory changes become rarer as life advances; but as the circulation begins to lack energy, there ensues a tendency to venous plethora of the abdominal viscera. Gout now especially assails its victims in both sexes; in women the menopause is often marked by a temporary reversion to the maladies of their childhood, eczema, hysteria, epilepsy, erysipelas, insomnia. In both sexes the bloodvessels begin to degenerate by fatty calcareous and fibrous metamorphoses.

*Old age*.—The individual man grows old by processes of degeneration, which are very profitable to study. The body does not reach its full development until twenty-five, and up to sixty years of age the skull and the heart still increase in size; the skull-cap loses substance from its interior, and continues to enlarge slightly at the frontal sinus, and therefore anteriorly; the brain becomes heavier, harder, tougher, and less vascular as life goes on; the arteries degenerate, becoming less elastic, and the capillary walls, as they thicken, offer increased resistance to the circulation of the blood; less fluids permeate them, and all the tissues shrink—a fact rendered most apparent in the loosest cellular tissues; the extremities of the body thus appear to starve and fossilise before the central parts. The arteries thus become rigid and dense at the expense, and often at the cost of obstruction, of the vasa vasorum, or of their nutrient vessels; they lie looser in their beds, and are less stretched; the total quantity of blood contained in them is diminished; indeed, the blood itself is probably diminished throughout the body, besides circulating more languidly, the veins holding rather more and the arteries rather less as life advances, but the veins therefore being more tortuous and distended.

The lungs, to illustrate small things by great, become more tortoise-like; the air-cells lose their elasticity, and yield to pressure, enlarging by natural usure, and becoming in all parts somewhat, and in certain places where least supported, specially, emphysematous. This emphysema involves two certain events: a relative diminution of aerating surface, and of the pulmonary capillary area; less blood, and less highly oxygenated blood, therefore passes into the systemic circulation.

The greatest vital capacity or fullest measure of air is changed at the lungs in an experimental efforted respiratory act at the age of thirty, according to Bourguery; it begins to decline from thirty-five, according to Hutchinson, but the quantity of tidal air, the inspired and expired air of each ordinary respiration, increases progressively with increasing years, more air requiring to be changed by reason of the steadily diminishing aerating surface. Think, however, what this must involve in increased muscular effort thrown upon the heart and respiratory muscles. An infant needs to breathe so slightly to oxidise its blood that when asleep you may scarcely mark the respiratory movements; but the old man has mostly to sit up

to breathe with comfort, and the acts are distinct enough to count easily, and the expiratory act is relatively prolonged and laborious.

Without pretending to give you any complete account of the physiology of old age, directing your attention merely to those principal features which appolnt the morbid imminences of advancing years, beyond and beside the loosening and falling out of the teeth, the diminution of all the digestive juices, which proceeds hand in hand with the drying up of the sap throughout the tree, the shrinking of all the tissues, the absorption of the subcutaneous fat, the diminution in bulk of the voluntary muscles, the tardiness with which volitional acts are fulfilled, and the vacillation with which they are accomplished, let me devote the little time left me to the mode in which the bladder and brain age.

The coats of the bladder grow thicker and firmer, and it no longer admits of such easy distension as formerly. It is more intolerent of its contents; and the prostate gland, which is commonly enlarged, offers some obstacle to its ready and complete emptying of itself.

The skin fails to fulfil its functions in more ways than one; the muscular supports have atrophied, and it is kept less stretched. Its subcutaneous fat has been absorbed; it is, therefore, less well plumped out; it is less vascular, drier, and more sticky. It is far less good as an article of clothing, and less efficient as an organ of excretion. It requires good cleaning with warm or tepid baths, very regularly, to promote its functions; and the body needs coverings that shall exactly adapt themselves to the season. But, with every care, the kidneys and the lungs and the intestines will have to fulfil vicariously the cutaneous functions. Hence increased urination, and the proclivity to bladder catarrh, bronchial catarrh, and diarrhoea.

There is a death, no doubt, by natural old age—a death perfectly simple and sudden, which carries off old people usually at night and in cold weather; thus removing, perhaps in sleep, persons who had gone to bed apparently as well as usual. No single lesion may be found to explain this death, although no organ of the body but has undergone the pathology of blocking up and wearing out. The individual eventually dies then because his heart ceases to beat. But King Death thus stepping in as a thief in the night is a very rare event. Old persons die more often after due care at the hands of their medical advisers by natural pathological processes. There is death approached by the bladder road under the ablest surgical charioteering: enlarged prostate, thickened bladder, retained urine, catheterism, cystitis, catarrhal nephritis, typhoid, uræmic symptoms,—about which I will only advise you, if you seek to keep your patient, to learn from my experienced colleagues how to resist the temptation of passing a catheter. There is death approached by the narrowed pathway of the degenerate and obstructed arteries, by paralysis, by apoplexy, by peripheral embolism, by senile gangrene. Lastly, and in my own experience most frequently, death is approached by diarrhoea in summer, and broncho-pneumonia in winter; in either case the final illness is short enough—a few days or a week at most. This broncho-pneumonia of advanced years is clinically very important for you to recognise. When some old person eighty and upwards, the habitual subject of bronchial catarrh, says to his ordinary attendant one morn-

ing that he is tired, and will lie in bed, a thing he has never done before; take heed, if his cheek is flushed, his eye a little brighter than usual, and his inclination to talk and tell you tales of his childhood greater than usual—beware, towards night-time he will “babble o’ green fields,” talk of those long since dead as if they were living and ought to come home, just wander in his mind a little, but be easily roused to think and answer correctly. Watch him carefully; he is near that haven where he would be, where he shortly will be, for his tongue is dry, and he has an eager thirst, and he is drowsy but sleeps little, and awake but not all, and he has short quick breathing, and little fits of coughing, but not his old, long, suffocating cough; and he expectorates but little, and that little with difficulty: the end is not far off, and you had better inform his relations that you recognise the danger.

But I have left out too much, and am vainly endeavoring to press more than will squeeze into one hour’s doctination.

“While man is growing life is in decrease;  
Our birth is nothing but our death begun,  
As tapers waste that instant they take fire.”

I have wished you to formularise your ideas upon the natural revolutions effected by time in the body, and to discern their revelations—

“Mankind mistake their time of day:  
Like damaged clocks, whose hand and bell dissent,  
Folly sings six, while Nature points to twelve.”

It is the disagreeable duty of the hygienist to correct them sometimes; as Pilny said, “*Ex præteritis futura deprehendere*”—to forecast the future from the past—remembering Shakespeare’s words:—

“There is a history in all men’s lives  
Figuring the nature of the times deceased;  
The which observed, a man may prophesy,  
With a near aim of the main chance of things  
As yet not come to life; which in their seeds  
And weak beginnings lie intreaured.”

#### LECTURE IV.

I TAKE Sex for my subject for to-day.

The anatomical features distinguishing the two sexes do not require notice by me. I have to deal with the generative functions, their establishment, their due fulfilment, and the degree in which they influence individual health. The establishment of puberty takes place somewhat earlier in girls than in boys, but in both sexes its advent is greatly influenced by climate and surrounding conditions, by race and by habits of life, being earlier in hot climates and among Eastern races, in those brought up in hot rooms and highly fed; acquired early, it terminates early, and, conversely, if late, late.

The full perfection of sexual abilities is gradually attained in both sexes, more gradually in the male than in the female.

The sexual epoch may be described in the male by an arc-line commencing at or about the age of sixteen, gradually mounting up to a summit of highest vigor at thirty-five, maintained at its acme of energy between thirty-five and forty-six, and steadily decreasing by more sudden descent than its curve of ascent between forty-six and sixty-three. The capacity to procreate is retained in males after sixty-three, but the children born to fathers after

that age are seldom the finest specimens of humanity, mentally or bodily.

Menstruation in girls begins as a rule, in England, between the ages of fourteen and sixteen, although it is very often established at eleven in individuals born of young and vigorous parents, inheriting well-developed frames and possessed of nervous or sanguine temperaments. The lymphatic temperament is latest in maturing. Tacitus ascribes the inexhausted virility of the ancient Germans to the late age at which sexual indulgence and marriage was postponed among them. Thus, “*Sera juvenum vinus coque inexhausta pubertas; nec virgines festinantur; eadem juvenia; similis proceritas. Pares validæque miscentur ac robora parentum liberi referunt.*”

Women rarely reach their maximum aptitude for bearing vigorous offspring until the age of twenty-two—indeed, from twenty-five to twenty-eight is the best age for women to become mothers for the first time. The average duration of the reproductive faculties in women is thirty years; of the procreative faculty in men fifty years.

Puberty modifies the individual constitution very importantly, and the two sexes somewhat differently: thus, the female derives a mental impetus, her intelligence expanding with increasing development of her form and the perfectioning of her generative apparatus. The male more often exhibits an intellectual drawback; in him the stimulus to action is felt very profoundly; the muscular instincts, however, divide supremacy with the generative, and the chaste youth is constrained by his natural impulses, for a while at least, to spend his energies in field sports and win his way to fame by his arms and legs. The vicious practices prompted by perverted sexual instincts, and which are alleged to undermine the health of the body and to delay the expansion of the intellect, emanate, I believe, much more from over-exercise of the brain and its general unhealthy employment than from any excess of genital impulse.

Vicious habits are doubtless easily acquired at or about the advent of puberty, and they tend no doubt to delay the development, and ultimately the healthy performance, of the sexual functions; but they are habits that spring up from mal-hygienic conditions of life, and are promoted by evil companionship and insufficient out-door occupations. That grievous harm may arise from them in persons of nervous temperament, and who come of insane stocks, I will not dispute; but the full category of evils which have been traced by some authors to this source are, I am sure, for the most part imaginary. The evil is a real one, but not so great as it has been made out to be; and the remedy for it may be shortly detailed. First and foremost comes sound physiological teaching: the indoctrination of young males with the fact that perfect chastity of mind and body is not only feasible, but pre-eminently profitable towards the attainment of present and future happiness. Secondly: Active open-air sports with muscular companions, bodily and mental. There is an old French proverb worth remembering here: “*Qui fait almer les champs fait almer la vertu.*” Thirdly: Early going to bed, and early rising. Fourthly: A firm horsehair mattress and horsehair pillow to sleep on, keeping the spine cool. Fifthly: Cold or shower bathing. Sixthly: The society of pure and high-minded women. Seventhly: The cultiva-

tion of rational and elevating amusements—music, drawing, &c.

Those who have carefully watched the development of the male at the period of puberty have often noticed that a distinct enlargement and induration of the mammae take place in him, as also that some periodical changes take place in him remotely analogous to the catamenial impulse of the female. Sanctorius, and Gall after him, state that male adults in health, taking no more than their ordinary food, increase in weight each month from one to two pounds, with regularity, up to a certain date; when their mental state undergoes a peculiar and noticeable alteration, the individual becoming suddenly morose, captious, and irascible, dull about his duties, slow in his intelligence, and complaining both of himself and of those about him; digestion is slightly disordered, the bowels are constive, the urine is thick, and the complexion muddy or spotty; his sleep, too, is heavy and unrefreshing; then, on a sudden, some defluxion or crisis takes place—a purging or spontaneous profuse perspiration or urination,—and within twenty-four hours or so the bodily weight relapses to its normal mean, and the person returns to his more habitual and better-natured self. That such a condition of things is sometimes observable we may admit. In some males epistaxis and hæmorrhoidal hæmorrhages occur with a regularity little short of female periodicity; these spontaneous hæmorrhages, however, are especially prone to manifest themselves in vigorous sanguineous individuals during the spring of the year. As to the morbid imminences which puberty entails on the male sex, I cannot give you better or more general information than is contained in the old aphorisms of Hippocrates. Sect. 3, aphor. 26, 27: “Youths approaching puberty are subject to chronic fevers and epistaxis, inflammation of the tonsils, ascariæ, and round worms.” 29: “The affections of youth are bloodspitting, consumption, acute fevers, epilepsy.”

Sexual relations will be considered by me later on, when I have discussed the physiology of puberty in the female more minutely in its principal feature—periodical menstruation.

**Menstruation.**—Brierred de Boismont's observations showed that the most ordinary period for the menstrual discharge to last when this function was fully established was eight days, the next most common period was three days, and the next four days. The duration of the catamenia is longer in the inhabitants of towns than in those of the country, and in the small-framed and delicate women than in the robust and tall. It is most energetically and quickly accomplished in those who are essentially most vigorous.

Raciborski divides the life of the mature woman into menstrual and intermenstrual periods, the one lasting at most eight days, the other from twenty to thirty-nine days. You ought further to be informed of an anomalous but not very rare condition that obtains in some women called double menstruation, the discharge recurring every fifteen days with great regularity. The subjects of this anomaly are said to be sexually feeble, seldom make happy wives or fertile mothers, being especially prone to miscarry whenever they become pregnant.

The ensuing facts about menstruation, as to characters and physiological features, I give you upon Raciborski's authority:—First period of in-

vasion, lasting one to two days, the character of the discharges being brown blood-colored mucus; second period of intensity, lasting two days, the character being arterial-looking hæmorrhage mixed with mucus, and the physiological concomitant, hæmorrhage into Graafian vesicle; third period of gradual cessation, lasting three days, the character being blood-cells decreasing, mucus-cells increasing, and the physiological concomitant, bursting of Graafian vesicle.

**Intermenstrual periods.**—First of non-colored secretion lasting five to eight days, the character of the discharge being clear mucous globules mixed with fragments of epithellium; second, of sharp pain, occurring on or about the eighth day, after all colored discharge has ceased, with the physiological concomitant of the passage of an ovum through a Fallopiian tube; third, of alteration of the vaginal secretions, occurring between the tenth and fifteenth day after the cessation of the colored discharge, the character being thickened milky discharge, with albuminous cotton-ball-like shreds, and the physiological concomitant, discharge of more or less broken up membrana caduca and ovum.

We learn from this, that menstruation, which term attaches only to the colored discharge, is followed normally by hypersecretion, which lasts throughout about fourteen days in time, and is possessed of certain characters which appoint different physiological incidents. About the fifteenth day from the commencement of menstruation the escaped ovum traverses the Fallopiian tube, this passage being often attended by pain—pain much more distinctly recognised by some women than by others—pain often misunderstood by medical men, and treated under various terms, as neuralgia, ovarian congestion, &c. Both this pain and the natural hypersecretion, with its normal alterations of character, I have thought worth calling your attention to, since the phenomena themselves, from being misinterpreted, have been the source of some feminine bewilderment, and not a few errors in diagnosis.

Leucorrhœa, which women are apt to attach undue importance to as a symptom of some uterine disease, is a very common affection of the inhabitants of dusty, smoky cities, and is frequently due alone to the increased secretion provoked in the mucous membranes by the clogging up of the extensive glandular apparatus of the skin; and may be sometimes quickly and completely cured by the regular employment of hot and Turkish baths.

The period of highest functional activity in the sexual organs is that also which coincides with their greatest proclivity to disease. The largest number of uterine affections befall women between the ages of twenty and thirty-five years. Similarly, venereal discharges, syphilis, orchitis, stricture, &c., occur in males chiefly between the ages of eighteen and forty.

The popular belief that the climacteric epoch is especially fatal to women is not borne out by statistics; that it is a time of life when they are very prone to seek medical advice for ailments, bodily and mental, may be admitted. Uterine congestive affections affect females at or about the menopause—vicarious hæmorrhages, hæmorrhoids, rheumatic gout and pneumonia; and the disposition to the formation of cancers and new growths is apt to manifest itself at this same period of life; it is common enough, too, to observe women of

hysterical habit revert to the same fanciful quips and bodily cranks that distinguished their early womanhood.

But Benoiston de Chateaufort, in his "Mémoire sur la Mortalité des Femmes," shows that between thirty and seventy women exhibit no marked increase of mortality at any one quinquennial period above or beyond what is due to their regular progressive aging: thus, more women die between forty and fifty than between thirty and forty, but more men die than women between thirty and seventy, and the period between forty and fifty is relatively more fatal to men than to women.

As to the mode in which sex influences disease I can only tell you that fevers, zymotic diseases, scrofula, tuberculosis, and diseases of the organs of digestion appear nearly equally common to both sexes. Acute affections of the respiratory organs, croup, pneumonia, acute bronchitis and pleurisy, aneurisma, stone, gout, acute rheumatism, and chronic Bright's disease, occur more frequently in men than in women; whereas certain nervous disorders—madness, epilepsy, chorea, and neuralgia are more common to women than to men.

I have little time, and still less inclination, to discuss the influence of sexual relations upon the individual health; the sources of information are so meagre and the apparent results are so exactly what might have been anticipated. M. Bertillon, in a communication to the Académie de Paris, made Nov. 14th, 1871, has traced with a very able pen the influence of the married state upon the duration of life and the prevalence of mental disease and of crime.

He arrives at the following results:—That very early marriages—those of males under twenty years—tend to weaken the individual and greatly to increase the percentage death-rate; for example, from a total of 8000 men whose mortality unmarried, under twenty years of age, scarcely averaged 7 per 1000, the rise is to a mortality of 50 per 1000, these young married men between eighteen and twenty tending, therefore, to die at the same rate as those whose ages ranged between sixty-five and seventy.

Marriage, again, appears injurious to the lives of women when this state is undertaken at any age earlier than twenty-five years. The following facts, tabulated from M. Bertillon's statistics, may be left, however, to tell their own tale:—

#### *Age from twenty-five to thirty.*

| Males.     |                    | Females.   |                       |
|------------|--------------------|------------|-----------------------|
| Married,   | 6 deaths per 1000. | Married,   | 10.5 deaths per 1000. |
| Celibates, | 10 " "             | Spinsters, | 11 " "                |
| Widowers,  | 22 " "             | Widows,    | 17.5 " "              |

#### *Age from thirty to thirty-five.*

| Males.     |                    | Females.   |                    |
|------------|--------------------|------------|--------------------|
| Married,   | 7 deaths per 1000. | Married,   | 9 deaths per 1000. |
| Celibates, | 11 " "             | Spinsters, | 11 " "             |
| Widowers,  | 19 " "             | Widows,    | 17 " "             |

#### *Age from thirty-five to forty.*

| Males.     |                      | Females.      |  |
|------------|----------------------|---------------|--|
| Married,   | 7.5 deaths per 1000. | Not detailed. |  |
| Celibates, | 13 " "               |               |  |
| Widowers,  | 17.5 " "             |               |  |

The table is not so complete as we could desire. Further details appeared to show that from thirty-five to fifty the wives presented a steadily diminishing mortality below that which befell the spinsters and widows, but that the effect of celibacy upon women was much less dismal than upon men.

After forty-five the mothers of families enjoyed a greatly diminished death-rate as compared with the spinsters and widows. Insanity, again, is more common among unmarried than married persons, and the former figure more largely among the criminals in all states.

We should be hasty, however, if we deduce as much from these facts as M. Bertillon does. The married state implies, as our own Registrar-General rightly interprets it to mean, comparatively easy circumstances in by far the larger proportion of instances—conditions of life which favor its prolongation, greater comforts, more regular meals, better food, and temperate habits.

Enough. I am well aware how far short of its full hygienic importance my lecture on sex has been. The upshot of my own belief upon the difficult subject of sexual relations is, that while not a few women are happier, healthier, and more useful in their generation single than married, the proper state for most men, nay, for nearly all who at the age of twenty-eight or thereabouts have strength and energy to provide for something more than their own immediate wants and selfish pleasures, is that of marriage.

As medical men, let me further advise you not to delay to grow rich before you marry, nor to select a wife for what she may bring you besides herself. The greatest human happiness is successful exertion, the highest incentive to work is the necessity of providing for those whom nature has decreed ought to be dependent upon you; the surest help towards morality of life is that not impossible she who, well selected, may be expected to halve her husband's sorrows, double his joys, and treble his expenses, who when he is weary will cheer him, and when he is sick will nurse him as none other can.

## Lectures

ON SOME

## NERVOUS DISORDERS THAT RESULT FROM OVERWORK AND MENTAL ANXIETY.

By GEORGE JOHNSON, M.D., F.R.S.,

Professor of Medicine in King's College; Physician to King's College Hospital.

### LECTURE IV.

ONE of the chief objects which I have had in view in the three preceding lectures has been to describe those symptoms of nervous derangement which in a certain proportion of cases constitute, in fact, the earlier stage of some of the most formidable diseases with which we have to contend. A patient who now complains that he is unable to sleep, or that his sleep is habitually disturbed by frightful dreams and visions, may at no very distant period, if not relieved from these distressing symptoms, become the subject of some formidable if not incurable nervous disorder. Another object which I had in view was to trace these disorders to their exciting causes, and I have endeavored to show that, in a large proportion of cases, the origin of the nervous derangement may be traced

to the operation of mental influences, such as anxiety, grief and terror, or excessive intellectual labor.

For practical purposes, to know the cause of a disease is often of more value than an acquaintance with its anatomical results. If we can discover the cause of a symptom, or of a group of symptoms, and if the cause is one which can be removed or avoided or counteracted, we possess the knowledge which will best enable us to relieve our patient, although we may know nothing of the morbid anatomy of the disease, and but little of the relation and sequence of its phenomena; while, on the other hand, a very exact knowledge of the anatomical consequences of disease, without some insight into its origin and cause, may be entirely useless for any practical purpose.

In my previous lectures I have had frequent occasion to refer to principles of treatment, and to the influence of particular remedies on the various forms of nervous disorder which I have brought under your notice, and I purpose to devote the present lecture to a more detailed consideration of the important subject of treatment.

The observations which I am about to offer upon this subject will have reference chiefly to the earlier stages and the less serious forms of nervous disorder—sleeplessness or disturbed sleep, with its usual attendants and consequences, lassitude, loss of appetite, palpitation, and the other symptoms which were described in my second lecture.

The first point obviously is to ascertain the cause of the symptoms, and to inquire whether or not it be still in existence and operating. When the apparent cause is overwork, whether of brain or of muscle, the patient must be warned to abandon his work for a time, or to do less work. All nervous patients whose occupations are sedentary, or who are disposed to mope within doors, should be urged to take active walking exercise in the open air for at least an hour daily. To this it is often objected that they cannot afford the time; but the reply is that if they will perseveringly act upon the advice they will preserve their health and economise their time. They will actually do more work and they will be less fatigued and distressed by their labors. I have before referred to the importance of relieving the patient from any groundless fear as to the state of his health. The anxious patient will often be half cured at once by the confident assurance that he has no disease which is not remediable; and to give this assurance is one of the most agreeable duties that we can ever have to perform.

When all that is possible has been done to discover and avoid the causes of nervous disorder—when bad and unwholesome habits have been corrected, and when all needful advice and encouragement have been given, we have next to direct our attention to the consequences, some of which will continue long after the cessation of their exciting cause, while others are perpetuated by some persistent and unavoidable source of brain trouble.

Now, as we have seen, by far the most frequent consequence of overwork and anxiety, the one, too, which oftener than any other is productive of further disorder and mischief, is sleeplessness, or some form of disturbed and unrefreshing sleep; and the chief remedy for this, after the discoverable causes have been as much as possible removed, is a soporific at bedtime.

Before the introduction of the chloral hydrate I was in the habit of treating these cases with

some preparation of opium or morphia; and the result, in a large proportion of cases, was highly satisfactory. I may refer to Case 8 in my first lecture,\* and Case 19 in my third lecture,† as good examples of the striking benefits derived from the temporary use of opium at bedtime. The following case is another illustration of the same principle of treatment.

CASE 15.—L. H.—, a widow, forty-one years of age, was first seen at the dispensary on the 6th January, 1851. For many months her sleep had been disturbed by frightful dreams and spectral visions. Her friends told her that she talked as much in her sleep as when she was awake. She complained of a painful sense of weight on the top of the head, and her countenance was expressive of great anxiety. She drank neither beer nor spirits. She had been a widow eighteen months, and for many months before that she had suffered much from anxiety in consequence of the intemperate habits of her husband, who had squandered his money and failed in business. She had friends who were well off, so that she had never been in want; but her appetite was very bad, and she suffered much from flatulence and constipation. Before I saw her she had been cupped and leeches, and several times blistered, without benefit. On the 6th January I prescribed five grains of compound soap pill, to be taken every night; and a laxative in the morning, to counteract the constipating effect of the opium. I told her to walk out daily, and I gave her hopes of speedy amendment. She came to me on the 13th January, and said that she had slept better the first night after taking the pill, and the second night better still; she had rapidly improved in every respect, and had a bright and cheerful expression of countenance. To continue the medicine. My last report of her, on the 17th January, is as follows:—She considers herself quite well; she sleeps well without dreaming; the sense of weight on the head is gone; her appetite is good, and she has no discomfort after eating. She “feels quite a different person.”

The simple explanation of this rapid recovery appears to be, that ten nights of sound and refreshing sleep had sufficed to remove the wearying effects of many months of anxiety and restlessness. This case may usefully be compared with Cases 1, 4, 5, in my first lecture, which were treated with chloral, and with equally beneficial results. Since the introduction of the chloral hydrate as a soporific I have generally employed this valuable medicine as a substitute for opium in this class of cases, for reasons which I will now briefly explain.

One of the most serious objections to the use of opium as a soporific is its notorious tendency, in some cases, to produce an effect the direct opposite of that which we desire—to cause wakefulness and excitement instead of sleep and composure. This may sometimes be obviated by changing the form of the medicine or the mode of administration: by giving morphia subdermically, or opium by the rectum; in other cases, by combining the opium with a small dose of antimony (the tartarised antimony) or James's powder,—a combination which was strongly recommended by the late Dr. Graves to procure sleep and check delirium in some cases of fever. There are, however, some

\* THE LANCET, September Number, 1875.

† THE LANCET, January Number, 1876.



patients on whom opium or morphia, in any form or in any dose, has the effect of causing troublesome constipation, nausea, vomiting, distressing prostration and faintness, and sometimes severe headache.

The advantage of the chloral hydrate are chiefly these. It is a far more certain soporific than opium, so that when given in a safe but sufficient dose of fifteen to thirty grains it rarely fails to procure sleep. Then it comparatively seldom gives rise to any unpleasant symptoms. Its nauseous taste sometimes, though rarely, excites vomiting; and in some few cases I have known it cause headache. It disturbs the digestive organs much less than opium; and it rarely, if ever, causes constipation. One of the most common and most disagreeable effects of the chloral is its tendency, in some cases, to cause redness of the eyes and flushing of the face—a tendency which is much increased by even a small quantity of wine or alcohol in any form. A few months since I was consulted, for the first time, by a nervous lady, who complained to me that for the last fortnight she had been distressed by finding that if she took a single glass of wine at lunch her ordinarily pale face became suffused with a crimson flush. I at once suspected the cause, and asked if she had been taking chloral. She had been taking twenty grains of chloral every night for a fortnight, the exact time during which the flush of the face had occurred. The chloral was discontinued, and her face soon ceased to be flushed.

The general result of experience is, that while in suitable cases of nervous excitement and wakefulness the chloral hydrate as a soporific is far superior to the preparations of opium, it is much inferior to the latter as an anodyne in cases of neuralgia.

The average dose of the chloral for an adult is twenty grains. I have rarely given more than thirty grains. The rule is to give the smallest dose that will suffice to procure refreshing sleep, and so to break the habit of wakefulness or dreaming restlessness. In most cases this object will be attained by a nightly repetition of the dose for a week, with perhaps a diminished dose for another week. It is seldom necessary or desirable to continue the medicine for more than a month, though in some cases it may be necessary to extend the period considerably. As to this, it is difficult to prescribe a general rule. In many cases I have found that the beneficial effects of the medicine have been immediate; the patient has slept soundly, the distressing dreams have ceased, the appetite has returned, and the patient has rapidly regained strength and spirits. After a few nights of sound sleep have been thus procured, the medicine should be discontinued, and in most cases the patient will sleep as well without the medicine as with it. There is probably no method of treatment which has the power of rapidly removing such a number and variety of distressing symptoms as chloral or opium when the soporific action is really favorable in this class of cases, the benefit being due, not to the direct effect of the narcotic, but to the marvellous influence of sleep in refreshing both body and mind. In some cases, when chloral alone has failed as a soporific, I have found a combination of chloral with morphia successful, while in other cases the chloral has been usefully combined with from ten to twenty grains of bromide of potassium. In others, again, the bromide of

potassium alone, in twenty-grain doses at bedtime, has had a soothing and beneficial effect.

But may not the frequent repetition of a soporific dose of chloral or opium become a necessity for the patient? This is a question which we are bound to face. There are few results of medical practice which I should more regret than the reflection that I had in any way contributed to make recourse to narcotics or stimulants habitual or necessary to a single patient. I believe, however, that a cautious use of chloral is attended with little danger of leading to so terrible an abuse of the drug. As I have before said, the medicine should be discontinued as soon as it can be dispensed with; as soon, that is, as restlessness and frightful dreams have ceased to harass and exhaust the patient. The rapid convalescence, and the renewed health and strength and spirits, which are so wonderfully promoted by securing sound and refreshing sleep, will generally enable the patient at once and without difficulty to dispense with artificial aid. I should strictly forbid narcotics of every kind for a patient who neglects directions which have been given him as to exercise, diet, &c., and whose nervous restlessness appears to result from such negligence. In other words, I would not encourage a patient to trust habitually to chloral or opium for the removal of discomforts which might be avoided by the exercise of self-control and obedience to sanitary laws.

The chloral hydrate which, with the precautions before mentioned, I look upon as a safe and most valuable remedy, is subject at the present time to two kinds of *abuse*: while, on the one hand, it is indiscreetly, and therefore injuriously, employed by some practitioners, and perhaps by some patients without medical advice; on the other hand, it is decried by some physicians as a pernicious and dangerous drug. It is your duty and mine to avoid these two unreasonable forms of abuse. If the right use of a remedy is to be condemned because it is liable to be wrongly and mischievously employed, then with the abuse of hydrate of chloral must follow that of opium, alcohol in its various forms, and, indeed, of all our most valuable remedial agents; for of each and all of them the maxim is true—"Nullum in remedium pro auxilio est nisi tempestivo usque tale fiat."

After all that I have said of the value of chloral and of opium in suitable cases, I warn you that you must not fall into the routine practice of giving narcotics to every patient who complains of inability to sleep. Your first care must be to discover, and then, if practicable, to remove the cause of the insomnia. You will meet with some indolent patients for whom the best soporific is some regular useful occupation and daily active exercise in the open air; for others, who are feeble, tonics and nutritious food, with a moderate allowance of wine, will be the appropriate remedies; and, again, in other cases dyspeptic symptoms will cease, and refreshing sleep will return, under the influence of a scantier and a carefully regulated diet, with an occasional purgative. In cases such as these narcotics would not only be unsuccessful, but would probably be injurious.

I have lately seen a remarkable illustration of the influence of a complete change of diet in removing chronic dyspepsia and painful nervous symptoms resulting therefrom.

CASE 16.—Major N—, aged fifty-four, consulted me first on the 21st of November, 1874. He

had been a dyspeptic for many years, the chief symptoms being uneasiness and flatulence after food, with habitual looseness of the bowels. For some months past he had suffered from painful nervous fancies, almost amounting to mental illusions, which nearly disabled him from work. His sleep is disturbed by dreams, and he tosses and kicks about, much to the annoyance of his wife. There was no discoverable cause for mental anxiety. On that occasion I prescribed a mixture of quinine and hydrochloric acid, to be taken after food, and twenty grains of chloral hydrate at bedtime. He came on Dec. 5th, and reported himself somewhat better, but there was no decided amendment. After reconsidering the case, I said to him, "I believe that all your symptoms are the result of dyspepsia. Your food passes undigested into your bowels and causes diarrhoea. Another result of this imperfect digestion is that your brain is ill-nourished, and hence arise your nervous symptoms. Try for a week or two a diet of cold or tepid new cows' milk exclusively. Go on with the tonic, but leave off the chloral." On Dec. 18th he came again, and reported that he had taken about six pints of milk daily. For the first two or three days he took a little bread, but for the last ten days milk alone. He is much better in every respect: the bowels have acted comfortably once a day, he has slept more quietly, he is in better spirits, and, as he said, "more like a human being." I have seen him four times during the present year (1875), the last time on Sept. 6th. The improvement has continued: the bowels act regularly once or twice a day, he sleeps fairly well, is in good spirits, and well able to do his work. His diet has been mainly milk and toasted bread, but I have advised him to take roast mutton with some cooked vegetable.

The cases of nervous disorder in which the treatment by hypnotics is most rapidly and completely successful are those in which the symptoms are the result of some bygone grief or anxiety, the impression of which remains and is perpetuated by inability to obtain refreshing sleep. In such cases sound sleep for a few nights, procured by opium or by chloral, often effects a rapid cure, and this, too, in some instances, after the nervous symptoms have continued for many months, or even for years. The first and third cases recorded in my first lecture, and the fifteenth case given in the earlier part of this lecture, are good examples of the beneficial effects of the plan of treatment to which I refer.

Another class of cases in which equal benefit is often derived from a similar plan of treatment are those in which the nervous symptoms have been induced by continued overwork, whether mental or bodily. In such cases it is obviously desirable that the patient should have a complete rest, or, if possible, that he should lessen the amount of his work. It is a remarkable fact that when overwork has induced that disordered condition of nervous system which I have described, the mere cessation of work does not bring with it the required rest so long as the sleep continues to be disturbed by dreams. This habit of dreaming requires to be broken before rest and refreshment come. The overworked solicitor's clerk (Case 4) was more rested by a few nights of unbroken sleep than by a month's holiday; and Dr. — (Case 5) obtained by the same means, while still going on with his work, relief from distressing symptoms which rest

at Brighton had failed to afford him. I have seen a considerable number of cases of overworked men in which a few nights of refreshing sleep obtained by chloral or opium at bedtime have effected a greater restoration of brain power than had previously been obtained by a long abstinence from work while the sleep continued to be broken by dreams.

The cases which are the least likely to be benefited by this or by any other plan of treatment are—1st. Cases of confirmed hypochondriasis or melancholy of very long duration, and especially when they assume the form of so-called religious despondency. This pitiable state of despair is not unfrequently the result of alarm excited by the frantic ravings of some half-educated and wholly irrational preacher, whose caricatures of the Creator and the moral government of the world are as frightful to contemplate as the most hideous figure of any bogie that was ever dressed up for the purpose of exciting terror. 2nd. Cases in which extreme nervousness has resulted from great terror or a sudden violent mental shock, which has left a deep and indelible impression upon the mind and nervous system. 3rd. Lastly, cases in which the symptoms of nervous disorder are perpetuated by some present unavoidable and irremovable source of anxiety or sorrow. Every practitioner of large experience knows that cases of this kind are only too common.

When insomnia and nervous disorder are the result of excess of alcohol, with a deficiency of nutritious food, the main point is to withdraw or lessen the poisonous alcohol and to substitute wholesome nutriment. In these cases, after the nervous system is calmed and tranquillised, sleep returns without the aid of narcotics; but I look back with much satisfaction to some cases in which, by a temporary use of a soporific at bedtime, I have greatly assisted a patient to break through a habit of chronic intemperance. I will give some brief particulars of one case of this kind.

CASE 17.—F. R.—, aged forty, a carpenter, came to me at the dispensary May 27th, 1850. For some years he had been in the habit of drinking rather freely both beer and spirits; he had worked hard, and had suffered much from anxiety consequent upon family misfortunes and disagreement. For many months past he had been troubled by vertigo and headache; his sleep was disturbed by frightful dreams and spectral visions; his appetite was bad, his digestion disordered, and he often suffered from vomiting. He had been leeched about a dozen times for the vertigo. Latterly he had been almost incapacitated for work. His countenance was anxious, his eyes suffused, and his tongue coated and tremulous. I prescribed two grains of opium in a pill at bedtime every night, and an aperient of rhubarb and magnesia occasionally; and I advised him to take no beer or spirits. Four days after (on May 31st) the sleep had been somewhat quieter, and he felt rather better. On June 3rd the dose of opium was reduced to one grain, a mixture of the sulphate of quinine and iron was prescribed, and an aloe pill occasionally. On the 18th of June the report runs thus:—He has continued to take the medicine; he sleeps well without dreaming, awakes refreshed, and feels a pleasure in commencing his work at five or six o'clock in the morning, whereas before he had some difficulty in being up by nine o'clock. He feels much stronger and less nerv-

ous; has lost the dizziness; his countenance is much improved; his tongue is clean and not tremulous; his appetite is good. He had taken no stimulants, and has resolved to abstain entirely. The opiate was then omitted, but the tonic was continued.

There can be no doubt that in this case the vertigo and other symptoms were aggravated by the repeated leeching, and by the continued drinking of beer and spirits while the appetite was bad and the digestive powers impaired. He was quickly restored to health by sleep and by the recovery of the power to eat and digest his food. In cases similar to this, after a course of chronic intemperance, it will often be found less difficult to abstain entirely from alcoholic stimulants than to take them in moderate quantities. I am not sure that this man continued his total abstinence, but I believe that he would have returned to me if he had suffered a relapse. It is notorious that inebriates are liable to a relapse, even after an interval of years. About ten years ago I advised a man who had just recovered from delirium tremens, in the hospital, to try total abstinence. Seven years afterwards he was readmitted with delirium tremens; and when he had recovered he assured me that after he left the hospital he had acted upon my advice, and taken no alcoholic liquor until a fortnight before his second admission, when, on the occasion of his son emigrating, he had been induced to take a little; this led on to a continuous bout of drinking, with little or no food, until, at the end of a fortnight, he was once more in the horrors of delirium tremens. With this man, as with so many others who have once been excessive consumers of alcohol, total abstinence was easier and safer than moderate indulgence.

As the habitual abuse of alcohol is notoriously a frequent cause of nervous disorder, so its cautious and judicious employment is in many instances a most important means of cure. We not unfrequently meet with cases of obstinate restlessness, either with or without delirium, the result of intense grief or long-continued anxiety, or of watching and fatigue, or of some exhausting illness in which there is mental excitement proportioned to the general bodily weakness. In these cases, often the usual narcotics entirely fail to procure sleep, even when they do not increase the excitement and distress; and the surest mode of arresting the collapse and calming the nervous system is to give wine or brandy more or less liberally, with frequent supplies of beef-tea, milk, and eggs.

Quite recently you have had the opportunity of seeing a case of acute mania successfully treated by a method somewhat out of the usual course.

CASE 18.—G. H.—, aged sixteen, a book-finder, was admitted into Twining ward on the 20th October, in a state of maniacal excitement, having been found in the street very scantily clothed and unable to give any account of herself. When placed in bed she constantly threw herself about, pulled off the bedclothes, and laughed and talked incessantly. Her friends stated that for the past four days she had complained of headache and giddiness, but she had continued her work until the day before her admission. The only assignable cause of her illness was that for the past fortnight she had been removed from a room in which she had been in the habit of working to one in which machinery was at work. On the day of her admission she had twenty grains of chloral

hydrate at bedtime. She slept after this for a few hours, but when she awoke she was as noisy and violent as ever. She was removed to the refractory ward, and ordered to take twenty grains of chloral every three hours. After several doses of the medicine had been taken, it was evident that it had no beneficial soothing influence; the excitement and maniacal delirium were unabated. The house-physician, Mr. Philip Birch, now asked my permission to have her packed in a wet sheet and blankets. To this I assented, the more readily from my recollection of a similar case thus treated by my friend and colleague, Dr. Sheppard, and recorded in his able and interesting "Lectures on Madness" (p. 58). Accordingly, on the evening of the 24th, the chloral having been discontinued, she was packed, and, as the excitement was evidently lessened, she was kept in the wet sheet and blankets for eight hours. On the following day (the 25th) the excitement was much less, but not entirely subdued, and in the evening the packing was repeated for about three hours. On the 26th, having had a good night and being quiet and rational, she was allowed to return to Twining ward; and on the 28th she was discharged cured.

In this case, the chloral having entirely failed to subdue the excitement and delirium, the wet pack effected a complete cure with great rapidity.

In conclusion, gentlemen, let me express a hope that, while I have excited your interest in the class of cases which I have discussed in this brief course of lectures, and have thus facilitated your recognition of them when you meet with them hereafter in your daily practice, you will be careful to avoid a routine treatment, whether by narcotics or by any other means. Make each case the subject of careful study, and you will rarely fail to meet the symptoms by a suitable and successful treatment.

## Clinical Lecture

ON

## ABDOMINAL TUMOUR.

*Delivered at the London Hospital, Jan. 11th, 1876,*

By C. F. MAUNDER,

Surgeon to the Hospital.

GENTLEMEN,—I propose to address you to-day on a case which excited some interest when it was in the ward, by reason of the doubt which many of you had, before I saw it, concerning its nature—a doubt naturally raised by the positive statements of the patient. I often say and often request you in the wards to listen attentively to a patient's statement of his case, not with a view of necessarily acting upon it, for you must sift it, and discard that portion which you believe to be either unintentionally or wilfully untrue. I am afraid I must say that you should be more cautious with women than with men how you accept statements as regards their state of health. I believe it is not infrequent for women somewhat advanced in life,

and who have been mothers, but with whom many years have elapsed since last pregnancy, to be uncertain about or even ignorant of their present and unexpected *eniente* condition. I will read the case of the subject of this lecture.

*Case of Abdominal Tumour* (reported by Mr. T. W. Richardson).—Jane S—, married, admitted on Nov. 2nd, 1875, into the Princess Royal ward, under Mr. Maunder. The patient stated that she had been married four years and a half, and, until two years and a half ago, she had had fairly good health. Had had no children, but nine months after marriage thought she miscarried. Two years and a half previous to admission the patient had suffered from some inflammatory condition of vagina and vulva, which had lasted during six weeks, leaving the vaginal orifice much contracted. There was no medical advice sought during this illness. Menstruation had been regular until eleven months ago, when it ceased altogether. About this time she had noticed a small *lump in the left side* (about left ovary), which had gradually grown larger; also occasionally she had felt *darting pains* about the swelling, but insufficient to prevent sleep or distress her much. Had no "morning sickness"; no discomfort in defecation, nor painful micturition. Four months ago her legs had begun to *swell*.

When this patient was questioned as to the possibility of pregnancy, she said that such a thing could not have occurred by any chance, since, on account of this contraction of the vaginal orifice, attempts at coitus had been painful and unsuccessful, and that for the last six months it had been given up altogether. It was ascertained that there had been no penetration of the male organ for eighteen months.

On admission there was seen a large tumour occupying nearly the whole of the abdomen, smooth, movable, slightly unsymmetrical, projecting a little more on the right than the left side. The whole surface of the tumour was dull on percussion; slight fluctuation. At the sides of and around the tumour, the surface was tympanitic on percussion. The mammae presented no particular indication of pregnancy. On examining the vulva, it was found that the labia majora and minora were completely obliterated, and there remained dense white scar-tissue. In the centre of this was a depressed and slightly corrugated opening, barely sufficient to admit the little finger, and quite impervious to the index finger. A catheter was introduced into the bladder, and urine drawn off.

Mr. Maunder, unable to examine the uterus per vaginam, introduced his finger into the rectum, and felt that the uterus moved with the tumour. For this and other stated reasons he then expressed an opinion that the most probable condition was pregnancy, but that certainly the swelling was within the uterus. On listening just below the umbilicus the foetal heart was plainly heard beating about 140 per minute. The diagnosis was thus conclusive.

On Nov. 8th, at about 8 P.M., the patient was taken in labour in the ward at 10 P.M.; the head could be felt in the vagina through the small opening. Seeing it was impossible that the head could pass, chloroform was given, and the house-surgeon, Mr. John Job (in the absence of the resident accoucheur), with the little finger in the opening, enlarged it by an incision in an upward direction through the scar-tissue, and downwards through

the perineum. It was then found that the sides of the entrance would not yield, and two more incisions were made, one on each side. Forceps were now applied, and the delivery effected in about five minutes. Child at full term and living.

The first point that strikes you is that this patient had no special object in deceiving us as to her condition. She had not previously borne a child, and therefore could not compare notes with her past and present state. Beyond the mechanical enlargement in the abdomen, the symptoms of pregnancy were comparatively negative. The condition of the mammae did not help our diagnosis, and the swelling of the legs might be due to any mechanical obstacle pressing on the iliac veins. I have known a distended bladder cause such, and to be gone next morning when that viscus had been emptied. The pyriform shape of the swelling, its free mobility, and the whole being one with the uterus, appreciated per rectum, led me to express a decided opinion that the tumour, whatever its nature, was contained within the cavity of the uterus.

The abdominal cavity contains organs common to both sexes, but that of the female some peculiar to her. On being called, then, to determine the nature of an abdominal swelling in the latter, various viscera liable to become enlarged, both from disease and physiological change, as in pregnancy, will be passed rapidly in review before your mind. The first question that you should endeavor to determine is—Is the tumour connected with a pelvic organ, or what is more properly termed an abdominal organ, or is it independent of both, as in ascites? or is it adventitious, as in the instance of an hydatid cyst? You should then proceed to determine the presence or absence of the most common form of abdominal swelling, such as ascites, pregnancy, and ovarian tumour.

The next question for you to determine is whether the swelling be solid or fluid. Both will be dull on percussion, whilst one will fluctuate. The presence of gas you will of course recognise by tympanites. Having determined the existence of fluid, you ask, Is it circumscribed or not? and you will answer the question in the affirmative on finding dullness on percussion limited in all positions of the patient. Should this latter condition be present, then you at once eliminate ascites, because, as the fluid in this instance is only confined by the peritoneum, it gravitates in all positions of the patient, rendering the lowest parts dull on percussion, whilst the uppermost will be resonant from the presence of intestines containing gas and floating on the surface of the fluid. For example, when a patient thus affected lies on the left side, this will be dull, while the right will be resonant, and *vice versa*.

We now wish to determine whether or not the tumour be connected with the pelvic organs, such as bladder, uterus, ovary. And there is one circumstance common to all three: as they enlarge and rise out of the pelvis, they approach the anterior abdominal wall and push aside other organs, especially the intestines; and thus one evidence that the tumour is pelvic in origin is that the lower regions of the abdomen are dull on percussion, while, on the contrary, if the tumour spring from above and be in connexion with the liver or spleen, &c., the upper regions are then dull on percussion.

The next step is to differentiate the three pelvic sources of tumour—bladder, uterus, and ovary.

The finger in the vagina or rectum will appreciate the distended bladder or uterus, and the catheter will settle the question between these two.

*Case of Distended Bladder.*—To assist your diagnosis, never hesitate to use a catheter. Many years ago I came to the bedside of a patient who had been admitted with a contused shoulder. She drew my attention to a "swelling in her stomach," as she called it; and then exposed to view a decided tumour, unsymmetrical, inclining to the right side, and occupying the hypogastric and umbilical regions. It gave her no trouble, the history of it was indifferent, and she had just passed a good half pint of healthy urine. It was dull on percussion, and fluctuating. My mind reverted to ovarian dropsy; but, following my custom, a catheter was passed, several pints of urine were drawn off, and the tumour disappeared. I suppose the unequal length of the ligaments will explain the unsymmetrical appearance mentioned. The pregnant uterus is pyriform in shape, and freely movable in the abdomen. Fluctuation can sometimes be detected, as in the above case; whilst, by the finger in the vagina, the shortened cervix can be felt lost in, and continuous with, a firm tumour covering in the roof of the vagina. Independently of physiological symptoms and other physical signs, I rely upon this to determine that the tumour is not ovarian.

But I must also mention a possible source of error as regards the bladder. Some years ago a man about twenty-two years of age was brought into the receiving-room, and was there seen by two senior colleagues, who attempted and failed to pass a catheter. The patient was the subject of retention of urine, with a well-marked hypogastric tumour. I was requested to take charge of the case. On examination per rectum, &c., all the symptoms of distended bladder existed. I punctured the fluctuating tumour per rectum, and drew off a large quantity of clear, limpid fluid. As the tumour was emptied, to my surprise, urine flowed freely per urethram. The patient ultimately died of peritonitis. Numerous hydatid cysts, which had caused this, were found scattered about the peritoneal cavity, white one large one, extra-peritoneal, and occupying the pelvis, proved to be the supposed distended bladder.

I shall say little about enlargements of the liver and spleen, as the diseases of these belong more especially to the physician; but two sources of error, as regards the stomach, are worthy of mention, which have come under my care.

*Cystic Tumour of the Stomach.*—A young woman, some eighteen years of age, was admitted under Dr. Sutton, and handed over to me as the subject of ovarian disease. The tumour filled the belly, was dull on percussion, and fluctuating everywhere, excepting in the loins, which were tympanitic. I proceeded to perform ovariotomy, and as the sac was emptied of its contents, and itself gradually withdrawn through the wound, its attachment let me up to the stomach, instead of downwards to the pelvis. The patient died, and proved to be the subject of several cysts connected with malignant disease of the wall of the stomach. In this case the absence of tympanites below the tumour, by reason of its size, rendered an accurate diagnosis impossible. I show you the stomach and the remnant of the cyst.

*Distended Stomach.*—Another case is that of a female about forty-five years of age, sent to me

as being the subject of ovarian disease. In this instance a line of tympanites below the swelling settled that question in the negative at once. My house-surgeon, Mr. Vialls, took a cast of the abdomen during life, and I have it here. My opinion was that the swelling was a distended stomach, and so on post-mortem examination it proved to be, and consequent on obstructive disease of the pylorus. When the patient was sitting up the tumour was dull on percussion and fluctuating, when recumbent it was more or less tympanitic as the gases came to the surface. The size of the tumour varied in proportion to the vomiting. I am not aware that such a state of stomach has been elsewhere recorded.

## Original Papers.

### SOME EXPERIENCE OF THE SPHYGMOGRAPH IN MEDICINE.

By C. HANDFIELD JONES, M.B. Cantab., F.R.S.,

Physician to St. Mary's Hospital.

A RECENT writer in a medical journal says that the sphygmograph makes pretty pictures, but we cannot rely upon it to teach us anything of value. Such has not been my experience, and I think the subjoined cases justify my impression that the instrument is really of practical utility. The notes of several are very incomplete, having, in fact, been taken solely as brief memoranda without any view to publication.

CASE 1.—C. L.—, male, aged fifty-five, short, of broad make, light hair, active habits, states that he was always well until about thirteen years ago, when he had pertussis severely. In early life, however, he suffered from frightful palpitation of the heart, with perspirations. During the last four months has had trouble at his heart, consisting of palpitation, pricking pain at precordia, or else sensation of great heat; occasionally intermittent pulse; some tendency to faint in a theatre. Is very irritable; does not sleep well. All his family are gouty. Has a fixed pain in right loin, nearly constant. Heart and lungs seem quite sound. Pulse 70, regular. Can walk twelve miles a day. Urine is apt to deposit lithates or uric acid; is not albuminous; specific gravity 1015, palish, quite clear; is found on analysis to contain .31 grains of uric acid in two ounces. Habits temperate, takes a glass of spirit-and-water daily.

Nearly three years after the above observation was made, this individual was alive and fairly well. That he was the subject of gouty cardiac neurosis cannot be doubted, although the elimination of uric acid was not very defective, amount-

ing probably to 4, 5, or 6 grains per diem. It is

also certain that his arteries had undergone morbid sclerotic change, more, I am disposed to think, than was inevitable at his time of life. Such is certainly the evidence given by the tracing.

high specific gravity, and apparently normal. Yet the death of a brother from morbus Brightii was an ominous event, and the tracing is demonstrative of the existence of arterial disease. The dyspepsia and cerebral disorder, and the relief afforded by hydropathic treatment, are more easily explained on the view of some uræmic poisoning having existed than on any other. May not renal infirmity show itself in a failure to eliminate some other substance besides uric-acid urea, which, being retained, acts as a poison on the system?

CASE 8.—Mr. E—, about mid-age, highly nervous, of an excitable manner, is fully impressed with the idea that he is about to die, that his disease has made rapid progress. Complains of much palpitation and beating of the heart, which is

was free from albumen, and would probably have been passed in an examination as healthy. The tracing, however, shows the existence of arterial disease, more than can fairly be credited to the age. The cardiac hypertrophy was more marked, I think, on the state of the arteries than the lesion of the aortic valves, which, judging from the tracing, could not have been considerable. Probably the aorta had been stretched so much by the blood-pressure that its ventricular

orifice had become too wide to be completely closed by the valves. The sense of imminent peril to life depended, I believe, on the consciousness that the heart was overtaxed in its struggle to force on the blood through the contracted arteries, and that its reserve force was falling.

CASE 4.—D. D—, aged fifty, a large-made, tall man, for many years a great sufferer from migraine, which has quite ceased the last year or two; the attacks used to recur weekly. Is an active-minded man of nervous temperament. Seventeen years ago he had loss of speech for a short time. Some six months ago he had an attack of left hemiplegia, with some distortion of face, which lasted over ten days, and has now disappeared, with the exception of some weakness of the left leg. Some time before the seizure he had numbness of the left limb, and also much mental anxiety. He has long been feeling unequal to his work, and though he has lessened it he finds it still too much for him. Urine clear; sp. gr. 1019; mixes very evidently with nitric acid. Five weeks after his first visit the urine had the same characters; was distinctly albuminous. He had taken strychnia and phosphorus, was more active mentally, and had more power in his left leg. He is the brother of D. M—, Case 5.

In this instance there could be no question as to the existence of chronic morbus Brightii, the evidence of the urine coinciding with that of the tracing. With unsound kidneys and rigid arteries before us, there can hardly be any doubt as to the nature of the hemiplegic attack. Mere cerebral exhaustion from overwork might give rise to the palsy, but could not to the renal and arterial degenerations. These, however, by rendering the blood impure, and the minute vessels less freely pervious, might well occasion malnutrition and even hæmorrhage. Both degenerations, it should be remarked, were latent until looked for.

CASE 5.—D. M—, aged fifty-four, broad made, hair greyish, seems an energetic man. Is in tolerable health, but not so able for work as he used to be. Has had lately tingling sensations and shooting pains in both arms, and even now there is decided pain in the left little finger, said to be from rheumatic gout, but all the joints are quite free. He has also had, two or three times, curious failures of memory, which he describes as if he had lost a memorandum and could only partially recollect the subject of it—a sort of sprain of the mind, as he calls them. His urine, examined five days later, was of sp. gr. 1028, cloudy with lithates, and contained no albumen or sugar; its quantity was generally very copious. During the last two or three days the urine had presented heavy sediments;

when this occurs at the end of a period of weakness and general derangement, he finds himself

much better. He was quite temperate; took spirit-and-water at night, and a good deal of tea during the day. When I saw him fourteen days later he was in fair case, taking phosphorus.

The nerve disorders in this instance, viewed in the light afforded by the tracing and by the preceding case, seem to be probably the result of defective nutrition of the brain from obstruction of some of its small vessels. Certainly I could not regard them as mere symptoms of exhausted nerve-force, although no doubt the patient had been overworked. The function of the kidneys was well performed, as far as an ordinary examination could discover; and there seems to be no ground for attributing the failure of nerve-force to any toxæmia.

CASE 6.—Mrs. B—, aged fifty-one. Her father was not in the least gouty; her mother is alive, aged eighty-seven; "has had rheumatic fever twice, and is almost deranged with her nerves." Catamenia absent last seven months; were very scanty before. Says she is very weak; can walk but little; three or four months later she was able to walk two miles. Bowels constive. Urine: sp. gr. 1022, palish, clouded with lithates, not albuminous, crystallises spontaneously when half its volume of nitric acid is added, often deposits uric acid. Pulse 75-90, jerky, rather hard. She had a great variety of morbid sensations, even more than are often met with at the menopause. There were heat-flushes and perspirations, much rheumatoid pain all about her, strange horrid sensations in her head, "as if she had not half her senses," or was on the verge of a fit; at times suicidal impulses or feelings of dread, as if something dreadful was about to happen; numbness of fingers at night; irritation and tingling at the back of her head; a "nervous excitable feeling" in the bowels, and at first a good deal of retching. Alcoholic excess was suspected, but I do not think that she erred gravely in that way. Nitrate of silver internally and bromide of ammonium were beneficial. She lost pretty nearly the bad feelings in her head, and the heats became less, but in other respects she did not improve. Phosphorus was of no use. Colchicum, aloes, and podophyllin aperients were used, but without any decided benefit. I was disappointed at this, for the character of the tracing and the cessation of an habitual discharge led me to expect much from them. Perhaps they were not employed vigorously enough. Lamp-baths did some good, and warm-packs might have done more, but I could not prevail on her to try them. The case is confessedly imperfect, but is worth citing as an instance in which a knowledge of the state of the arteries was certainly useful. She was not a common neurotic sufferer with the usual disorders of debility, and tonics—some of which I tried—were of no benefit.

CASE 7.—Mrs. H—, aged forty-seven. Is very stout, but used to be very thin. Is the wife of a publican. Takes little exercise. Catamenia ceasing. Has heat-flushes, but does not perspire. Has had for some time a troublesome cough; spits but little. A few small dry râles in the lungs. Sounds of the heart loud; no bruit. Is out of breath on slight exertion. Urine pale, cloudy with lithates; not albuminous. She was ordered a cough-mixture, containing a little ipecacuanha and oxymel of squills; and a pill of extract of acetate of colchicum and aloes every alternate night. In four days her breath was much better; she was

able to walk farther. The pills had acted well. The difference between the tracings of the first and second visit is sufficiently evident.

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from being overworked. He used then to be very drowsy. His father died at the age of eighty-one. One brother has died of Bright's disease, and one of epileptic fits or softening of the brain (he used to take much morphia). He has had much mental anxiety and worry of late years. In June, 1875, he had an attack in which he was not unconscious, but spoke thick as if intoxicated; and this impairment of utterance continues, and his memory is defective. He speaks freely and rapidly; there is no defect in ideation, but only in phonation. There was no paralysis in, nor has there been after, the attack, but for some time, when he wrote, his right hand seemed to run away from him. Before the attack he had much giddiness, and this continues to trouble him. His vision is very defective unless he uses glasses, of which he has two or three for various distances. He is a plumber, but has done no manual work for many years; has no blue line. Urine of good color, sp. gr. 1022, clear, not albuminous, deposits nothing but a little oxalate of lime. Tongue rather coated at back. Bowels regular. Is subject to palpitation of heart; does not know always what brings it on. Cardiac impulse felt in epigastrium; nowhere else; first sound appears normal, second is greatly prolonged, almost amounting to a murmur, at mid-sternum, at xiphoid, and at second right cartilage. Going upstairs distresses him much, often brings on palpitation, puts him out of breath. No râles in lungs. Perspires freely, especially about the head.

Is better in cold, frosty weather. Has a deposit of about the size of a pea—rather like a gouty—in



the left forefinger; has had pains in his toes and fingers occasionally, but no regular attack of gout.

Here the giddiness, the impairment of speech, the death of a brother with brain symptoms, have suggested the possible existence of a morbid change in the cerebral arterioles; but palpitation of the heart, the breathlessness, and the remarkable prolongation of the second sound, especially in the absence of signs of morbus Brightii, would have remained unexplained. The demonstration of rigid arteries by the sphygmograph both furnished a solid basis for the hypothesis of obstructed small vessels within the head and assigned a cause for the cardiac symptoms. Without the aid afforded by the tracing I am sure I should have been much at fault. The death of a brother from morbus Brightii is another instance of the affinity between renal degeneration and that of the arterial system generally. One point in the above history, and in another similar which I possess, is difficult of explanation—namely, that the patients were better in cold weather. One would have thought that the cold, by contracting the arteries still further, would have made the circulation of blood more difficult. Perhaps the heart's tissue may have been more braced by the cold than the arteries were contracted, so that the total result was good.

The instances given are all well-marked examples of increased vascular tension, the arteries generally being affected, both large and small. There seem, however, to be numerous instances, judging from the tracings given by good observers, where the artery actually experimented on, the radial, and presumably others of the same size, were by no means contracted, but the reverse. In these tracings the rise is high, the apex sharp, the fall rather abrupt, the diastolic well-marked, and the only morbid indication is a moderate rise in the earlier part of the descent, signifying retardation of the tidal wave.\* This rise in a minor degree may be seen in the tracings of perfectly healthy youths, and I think, unless it is much exaggerated, stress should hardly be laid upon it as a morbid sign. The very function of the arterioles as regulators of the blood-flow requires that they should undergo considerable variations in calibre, and so long as they can dilate readily and the secondary wave in question disappears after exercise, there is probably no serious morbid change. At any rate some distinction should be made between such tracing as that obtained in Case 1 and those now alluded to. It may be said that increased contraction of the arteries in any part of the system will cause general increase of arterial tension, and this may be true if by tension be meant increase of pressure on the inner surface of the arterial tubes. To me, however, there seems to be a very material difference between increased pressure of the blood and increased tonic contraction of the arterial muscles. The latter may produce the former, but the existence of the former by no means implies that of the latter.

It is tolerably certain, I think, that contraction of arteries will produce different effects according to the situation. Thus a narrowing in the third part of the subclavian will produce such a tracing as is represented in T 2, while T represents the tracing taken in a posture which left the artery

free. The man had previously been lying a good deal towards his left side, so that the clavicle was depressed, and flattened the artery to some extent

against the first rib. As soon as his position was altered, the tracing became what it had been on former occasions. S is the tracing of a man nearly

seventy years old, but active and vigorous both with limbs and brain. His radial is evidently inelastic, but his arterioles in the brain and elsewhere are certainly not obstructed, as far as one can judge from the functional activity of his organs. R is the trace of a male, aged fifty-two,

with gouty tendency, but no other apparent disorder. The rise is high, implying an uncontracted radial; the tidal wave is delayed, implying an obstruction in the arterioles. Dr. Galabin's Fig. 7, from a case of granular kidney with cardiac hypertrophy, is a marked instance of the same kind. Morbid contraction of the arterioles is, I imagine, a much graver matter than rigidity of the larger arteries, if the latter exist alone. That in some states the peripheral obstruction may be due to abnormal action between the blood and tissues, and not to arterial constriction, is probably true, but I think the part played by toxæmia is hardly so great as Dr. Mahomed supposes. In not a few such states—e.g., in typhus and typhoid—the pulse shows an absence of high tension.

The reality of such a condition as "arterio-capillary fibrosis" designates seems to me decidedly affirmed by the above histories, though I feel they are very incomplete. I do not think it can be said that the change was merely senile calcification, without any reference to renal disease: for in Case 4 the urine was albuminous, in Case 2 the father had died with dropsy (perhaps the result of æthma), and a brother had morbus Brightii; in Case 1 all the family were gouty, in Case 5 the patient was the brother of Case 4, and Case 8, also a brother, had died from renal degeneration. It certainly seems as if there was a condition of arterial morbid change, allied to that of senility, which has a notable tendency to be associated with renal degeneration, but yet may exist quite independently, as Gull and Sutton maintain.

In the tracings marked A, Aa, B, Bb, Ca, Cb, Ce, Da, Db, De, the question is raised as to the possibility of improving the condition of arteries which have begun to deteriorate. A is taken from the radial of a male aged fifty-three, and is evi-

\* Vide Dr. Galabin's pamphlet, Fig. 5.

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may be taken with much show of reason. There are many men, I am sure, between fifty and sixty whose arteries are getting rigid, and their kidneys deteriorating, who drive about in broughams all day, or breathe the close atmosphere of courts and offices, working their brains hard and their bodies idle, and repairing their nerve exhaustion with generous food and alcohol when the day's toil is over. Their vacations, when they take any, are spent in loitering about at seaside resorts, or touring in Scotland or on the continent, visiting cities and spas, and perhaps the tail of a glacier, probably never spending a whole day in the fresh air, or giving their muscles any serious work to do. Now I suspect there are not a few of these who might do much better, and, by cultivating more active habits both during their work and their play periods, might add materially to their term of life. An eminent member of our craft, hard upon seventy, takes his morning walk and run every day, and attributes his excellent health mainly to this practice. Surely there can be no doubt that abandonment of active exercise, entailing necessarily lessened oxygenation of the blood and disuse of the working tissues, must accelerate the inevitable tendency to decay which belongs to later life, especially when food and alcohol are taken freely. Catechisms and aperients are all very well as purifiers of the blood and lesseners of vascular tension, when no better means may be had; but if the heart and lungs are tolerably sound—which is of course essential,—much more, I believe, may be accomplished by a daily *breather*, supplemented by an annual ramble, when whole days are spent in pure open air. If I were bold enough to be a prophet, I should point to a period when the elder generation, instead of waiting till they have had a stroke, apoplexy or a touch of paralysis, or are laid up with arterio-capillary fibrosis or morbus Brightii, and then hurriedly summoning a physician to do impossibilities, will seek his advice betimes, asking him to supervise their vital functions, regulate their mode of life, and teach them to stay the morbid changes which they know may be silently progressing. For the due estimation of these the sphygmograph, in skilled hands, as those of Galabin or Mahomed, is, I think, indispensable.

Green-street, W.

## TWO CASES OF ANEURISM.

WITH CLINICAL REMARKS.

By T. HOLMES,

Surgeon to St. George's Hospital.

THE two cases here related appear to me of sufficient interest to deserve record, and I have waited long enough after their conclusion to assure myself of the permanence of the cure in each case—a precaution which, I venture to think, ought to be taken in every case of alleged cure of aneurism, particularly when produced by compression, and the want of which cannot but shake our confidence in many of the cases which we find recorded in periodical publications. Both cases are, as I believe, instances of traumatic aneurism—at least, of

aneurism produced directly by lesion or partial laceration of the vessel. This was proved in the second case by the appearance of the swelling directly after the receipt of the injury, and in the first by the remarkable fact of total loss of pulsation below the tumour and partial gangrene of the hand. The latter circumstance is so striking a feature in an aneurism of the upper extremity that it is worth a few observations. The patient, it will be noticed, did not himself remember to have received any injury, but in his occupation (that of a miner) more or less severe sprains and contusions are extremely common, and it is impossible to conceive any cause except mechanical violence which could have obliterated the main artery of the arm in a young man with a perfectly healthy heart and, as far as could be seen, perfectly healthy arteries. On the other hand, the occurrence of such obliteration as a result of injury is a well-known fact. There is in the museum of St. George's Hospital a preparation (figured on p. 77 of my recent work on the Principles and Practice of Surgery) in which the internal and middle coats of the axillary artery have been torn across, and the lacerated coats have been turned down into the tube of the vessel, obliterating it entirely. This arose in consequence of a fall from horseback in which the skull was fractured. There was no mark of contusion near the injured artery, nor any blood extravasated external to it; but the absence of pulse from that arm had been noticed during life, and the precise spot at which the artery was obliterated had been ascertained. Again, I remember seeing a patient of Mr. Prescott Hewett's in whom, after some injury in the groin, a loud bruit remained in the femoral artery, which persisted for the whole time we had him under observation—i. e., for several months. No other explanation seemed possible except that here also the internal coats of the artery had been torn, and that a portion projected into the calibre of the vessel, not closing it entirely, but causing friction and bruit. No aneurism was formed in this case, though we watched it with interest, expecting that such would be the result; but that the obliteration of an artery by an embolic clot may give rise to aneurism on the cardiac side of the obliteration is proved by numerous instances;\* and if this is the case while the walls of the artery are entire, still more probable is it when a portion of their thickness has been weakened by laceration and by the internal coats being dissected off the external by the blood-stream. There remains the question why such obliteration should lead to gangrene in a healthy young man, and why that gangrene should be only partial. In reply, I believe that the obliteration was at first only partial; that the interruption to the current of blood caused its partial coagulation; and that portions of coagula became lodged in the vessel and its branches, so that very possibly the trunk artery was obliterated at various points, or for a considerable distance, giving rise to unusual obstacles in the way of the collateral circulation, and thus causing the livid, atrophied condition of the whole limb; while the lodgment of similar clots in the digital arteries of the forefinger would easily explain why that finger should perish while the rest continued alive, although imperfectly nourished. At the present

\* For which see System of Surgery, 2nd ed., vol. iii., p. 421.

time the collateral circulation seems to have attained a perfection which permits of the perfect nutrition of the member.

The efficacy of direct pressure—i.e., pressure on the sac itself—in the cure of this aneurism was decided, and this form of pressure has now been used sufficiently often to prove its value in cases where, as in this one, pressure on the artery above is impossible, or even where such pressure or ligature of the artery above the tumour is very dangerous. I would refer the reader to a very interesting case lately published in the *Boston Medical and Surgical Journal*, and since reprinted in a separate form by Dr. Buckminster Brown, in which a femoral aneurism was cured by direct pressure applied during the extraordinary period of nearly six years. Much caution was necessary in the present instance, both on account of the position of the tumour and the probably weakened condition of the arterial coats; but no other form of treatment was possible except galvano-puncture, coagulating injections, or the introduction of some foreign substance into the sac; and all these plans would have involved such very serious danger to life that I shrank from using them.

The second case is one of a much more ordinary character, yet it presents some interest, mainly, perhaps, as a new example of the great superiority of the digital over all other forms of pressure, when judiciously and properly applied. In this instance I was fortunate in having the assistance of a very able house-surgeon and a staff of intelligent and careful pupils. My patient was also one far superior to the ordinary run of hospital patients both in intelligence and docility. The result was that pressure was applied for twenty-six consecutive hours without producing the least excoriation of the skin, and no other inconvenience except what was connected with the administration of morphia for the purpose of procuring sleep.

In another case lately under my care (of popliteal aneurism), the patient slept long and soundly while under digital pressure. And in both these cases the application of instrumental pressure rapidly caused soreness of the skin.

The case is also of interest as an instance of the great practical importance of the bruit in cases of pressure. When an aneurism, which has previously presented a loud bruit, and which therefore has presumably a narrow orifice of communication with the artery, loses that bruit under the application of pressure, the surgeon may be encouraged to believe that the cure is not far off, for that the mouth of the tumour has become so far obstructed that the rush of blood through it has ceased. A good deal of pulsation in the soft contents of the tumour is quite possible, and may persist for some time, though the pulsation will no longer have the expansile aneurismal character. And as it is of course very possible that the soft coagula obstructing the mouth of the tumour may break down again, the bruit should be carefully watched, and renewed pressure applied as soon as it reappears, as was done in this case. On the other hand, aneurisms which from the first present no bruit hold out much less prospect of the success of indirect pressure. This was the case in my patient with popliteal aneurism above alluded to. The tumour was very small, and quite devoid of bruit. All forms of pressure, though well borne by the patient, and most perseveringly tried, proved useless. It is in such cases that direct pressure should

be tried; and here especially I should expect that the use of Esmarch's baudage, lately introduced into practice by Staff-Surgeon Reid, of Plymouth, will prove most serviceable.

The notes of the cases are as follows:—

CASE 1.—*Subclavian aneurism, probably the result of partial laceration of the vessel; gangrene of one finger; cure under long-continued direct pressure.*—Benj. Y—, aged eighteen, was sent up to St. George's Hospital on Nov. 1st, 1874, by Mr. Edis, of Gloucester. He was a miner, and in very good health. He had been in active work till about a month before his admission; and as in the course of his labor slight accidents are common, he might have suffered some slight strain or blow on his right arm, but he remembered nothing of the kind. He noticed five months before his admission that the middle finger of the right hand felt numb and was white and cold, and that the whole hand got easily cold, so that he could not use it till he had warmed it; also that exposing it to cold gave him great pain. Soon after this he slightly injured the index-finger. He went on working, however, till a month before his admission, when he went to a medical man, who, according to his own account, told him that "the blood did not circulate in the limb," and gave him some medicine, which did him no good. Finding that the nail of the index-finger was beginning to separate and that the end of the finger was turning black, he went to Mr. Edis, who discovered a small pulsating tumour above the clavicle, of which, up to that time, the patient was quite unaware.

On admission, a small pulsating swelling, about the size of a horse-chestnut, could be seen and felt at the junction of the outer and middle thirds of the clavicle, close above the bone. The pulsation could be stopped by pressure on the subclavian artery above, though not without much difficulty and a good deal of pain to the patient. The tumour then subsided altogether. There was no bruit on listening over the tumour. No pulsation could be felt in either the axillary, brachial, or radial arteries. The arm was cold and livid, and smaller in size than the other; the index-finger was black and gangrenous down to the joint between the first and second phalanges, and the nails of the other fingers were discolored. He could bend all the other fingers, but not the index; and the latter was quite destitute of sensation. He could feel perfectly in all the other fingers when touched, though there was a sensation of numbness in them.

The arm and hand were enveloped in cotton-wool, and direct pressure was made on the aneurismal swelling by means of an india-rubber ball bandaged on to the tumour. The patient complained occasionally of severe shooting pain in the arm and hand, requiring the use of morphia subcutaneously; otherwise no fresh symptom occurred for some time. The gangrene slowly extended down the index-finger till it reached its base, where a line of demarcation formed; and on Dec. 7th the finger was removed at the metacarpo-phalangeal joint. This was followed by a sharp attack of traumatic fever, during which time the pressure was removed, but reapplied on Dec. 12th. The aneurism appeared slowly decreasing in size, and becoming harder. On Dec. 22nd the india-rubber ball was replaced by an instrument fitted to the neck and shoulders, and carrying a small pad on a double-jointed stem, which allowed the pad to be

securely adjusted on the swelling. Under this treatment gradual consolidation took place. The wound of the amputated finger healed slowly; the rest of the fingers recovered their natural color, and, as there was no longer any fear of gangrene, the cotton-wool was disused early in January. Finally, he left the hospital on Feb. 3rd, still wearing the instrument. The tumour was then harder and smaller. There was some pulsation, but no apparent expansion. No collateral vessels could be felt, nor any pulsation in any of the trunk arteries. He returned to Gloucester, where Mr. Edis was so kind as to keep him under observation. He writes on Dec. 20th, 1875, that "there is now no difference in the pulsation on either side near the clavicle. The warmth of the arm is restored; and, when seen two months ago, it was believed that there was some circulation through the brachial artery, though this was not certain. At all events the circulation has been wonderfully increased collaterally through the limb. He is now at work, and earning £3 a week as a miner, and looks in robust health."

**CASE 2. Femoral aneurism cured by digital pressure.**—Augustus A—, aged twenty-seven, a native of Portsmouth, had lived in Western America for the last fourteen years, and had kept a public-house in Oregon, but said that his own habits had always been strictly temperate. Had syphilis six years ago, and gonorrhoea five years since. In the middle of October, 1874, he jumped out of a car, a distance of about four feet, and felt much shaken, and noticed very soon afterwards a little lump about an inch and a half below Poupart's ligament. This gradually increased in size, and he went to a doctor, who told him at first that it was an enlarged gland, but afterwards that it was an aneurism. He then put himself under the care of a surgeon in Vancouver Island, who tried to cure the disease by digital pressure on the external iliac, combined with the pressure of a tourniquet on the femoral near its termination. Two applications of pressure in this form, for about three quarters of an hour each time, proved useless. He then went to San Francisco, where he seems to have been advised to have the artery tied, but decided to come to England. He was admitted into St. George's Hospital on Jan. 20th, 1875. There was then an aneurism about the size of a hen's egg in the right groin, extending to within half an inch of Poupart's ligament. The usual signs of aneurism—expanding pulsation, bruit, &c.—were strongly marked. The pulsation could be stopped by pressure made on the artery as it passes over the brim of the pelvis, and the aneurismal sac then seemed to be empty. There were amygdaloid glands in both groins. He was left quiet for a day or two, but as the aneurism was found to be evidently increasing in size and growing upwards, so that its upper part came nearer to Poupart's ligament, it was felt that something must be done at once to stop its growth. The patient was a man of great intelligence, and willing to bear any inconvenience necessary in order to avoid a dangerous surgical operation. A staff comprising twenty-five students was organised, who undertook to carry on the pressure for as long as might be necessary, in pairs, each pair taking twenty minutes, during which one held the artery for the first ten minutes, whilst the other kept his hand on the aneurism, and then the two changed places. Mr. Stirling, the house-surgeon, superin-

tended the compression, visiting the patient as often as possible, and the pressure was never relaxed except four times in the course of the day, when it was taken off to ascertain the condition of the aneurism at Mr. Holmes's visits. It was quite easy to hold an upper part of the artery while the compressors were changing hands, and, as far as could be ascertained either by the patient or his attendants, the artery was kept controlled the whole time. The patient, however, noticed that some of the attendants could manage the compression with far less pain to him than others. Thus the compression was kept up during the whole day and night, twenty-six hours in all, the foot and leg being wrapped in cotton-wool and flannel, and morphia given occasionally to relieve the pain. This, however, produced very troublesome sickness, otherwise he suffered little, and slept during a part of the night. At the end of the time the tumour was small and in great part consolidated. The bruit, which had been very loud, was now imperceptible; still there was some pulsation. A shot-bag of 2 lb. was laid on the artery in the groin, but this soon irritated the skin, and was disused. The digital compression was effected without any injury to the skin whatever. The tumour remained in the same condition for the next two days, pulsating slightly, but without bruit; then on January 29th it was noticed that there was a decided though slight bruit, and the pulsation seemed increasing. Digital pressure was accordingly applied in the same way as before for five hours. This stopped the bruit, and left the pulsation much reduced. During the following day the tumour became much smaller and harder. For the next two days it varied somewhat, a faint bruit being occasionally perceptible. This led to the conclusion that the mouth of the aneurism was occupied by clot, but not entirely occluded; and it was thought probable that the clot would gradually become more complete and fill the sac. Accordingly it was resolved not to renew the pressure unless some fresh symptom showed its necessity. The event justified this conclusion; for, on Feb. 2nd, the remains of pulsation permanently disappeared, leaving the patient with no inconvenience except coldness of the foot, which persisted for some little time, but not to any very marked degree. He was kept in hospital till Feb. 19th, when he was discharged. The tumour had then contracted to the size of a walnut, and was perfectly hard.

He was seen again about two months afterwards. There was no trace of the aneurism except a little, hard, ill-defined lump. The femoral artery could not be traced. The consolidated aneurism seemed to make some pressure on the vein, so that the limb became somewhat swollen after he had been up for some time, but without any superficial oedema. The limb was perfectly strong, and he could take active exercise nearly as well as ever, and was about to return to America. Still it seemed as if the temperature of that limb was below the other.

## REMARKS ON A

## CASE ILLUSTRATING THE OCCASIONAL PROTRACTED COURSE OF MALIGNANT (SCIRRHOUS) DISEASE OF THE STOMACH.

By I. BURNBY YEO, M.D., M.R.C.P.,

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THE following case, besides being interesting in many of its details, affords proof of a fact which is perhaps not very widely known—viz., that scirrhus disease of the stomach occasionally runs a very protracted course, and extends over a period of ten, fifteen, or even twenty years. The patient in question died in 1874; he first suffered severe gastric pain in 1857.

For the first part of the history of this case I am indebted to the kindness of Dr. Wilson Fox, who was consulted by the patient in August, 1868, he being at that time fifty-five years of age.

The following are Dr. Wilson Fox's notes:—"He first felt severe gastric pains in 1857, relieved by sulphuric acid, but it continued at intervals until 1861, when it increased in severity and became attended by acid vomiting. The vomited matters were never black or bloody. Fæces at this time black but not tarry; appetite lost. In the spring of 1868, after suffering from pain, great weakness, and loss of appetite, he suddenly became faint. The stomach became distended and painful, and the pain radiated across the chest. At this time he passed tarry stools repeatedly on several occasions, and they were seen, certainly on one occasion, by Dr. Grimsdale, of Liverpool. He suffered from frequent vomiting after food. His attacks of vomiting were associated with anorexia; these attacks would last for about a week, when the appetite would return and become ravenous. The vomited matters were acid, but not frothy, nor had they even the appearance of coffee-grounds. There was no increase of pain before passing the tarry evacuations. He stated that the pain in 1861 used to be relieved by eating, and would return three or four hours after food."

Dr. Fox further noted that the patient presented at this time an appearance of intense pallor; that there was no tenderness or tumour in the region of the stomach; that there were no piles, though he had suffered from them some years ago. The diagnosis was "carcinoma ventriculi."

The patient first consulted me in November, 1870, and complained of symptoms of dyspepsia. He told me of the unfavorable opinion Dr. Wilson Fox had formed of his case in 1868, but added that he had subsequently consulted a very eminent physician in London, who had given him a more favorable opinion, which he was himself disposed to accept—viz., that he was suffering from functional dyspepsia.

He was a gentleman of very great energy both of body and mind; he was in the habit of taking very active exercise, and of consuming a large amount of food, and his chief trouble was severe pain, with flatulence and acid eructations on going to bed at night—i.e., three or four hours after his dinner.

There was no tenderness or tumour in the region of the stomach or over any part of the abdominal

cavity, but he was emaciated, and had a pinched and unhealthy aspect.

A day or two after first consulting me he was seized with very severe pain, and I was sent for to see him, but being out of town he passed under the care of a homoeopathic practitioner at Highgate, where he lived, and I saw no more of him until the autumn of 1873. In October of that year he called on me to tell me he was quite well, that the *fons et origo mali* (I use his own words) had been discovered. That the fact was, he had all along been suffering from gall-stones, and that two seasons at Carlsbad and a winter in Algeria had set him right. He did not mention then, what I discovered subsequently, that he had been taught to use morphia hypodermically for the relief of the stomach pain, and to this fact must be attributed much of the obscurity which appeared hereafter to hang over his case.

He passed through the winter of 1873-74 comfortably, in the firm belief that all his previous sufferings had been due to gall-stones, and that, should they ever return, he had a certain resource in the Carlsbad waters.

In April, 1874, I was asked to see his wife at Norwood, and, observing that he was not well, I was told, incidentally, that he was suffering from another attack of gall-stone, but that he knew quite well how to manage himself: he was drinking a large quantity of the Carlsbad water; and when the pain was very severe, he obtained certain relief by the injection of morphia hypodermically. I was simply referred to by his wife to know if it was right for him to have recourse so constantly to this mode of relieving his symptoms: a question which was then, and on many subsequent occasions, pertinently answered by the patient, who demanded why he should be allowed to suffer pain when an easy and safe means of relieving it was in his own hands.

I did not see him again until the end of the following month (May, 1874), when I was summoned to see him as he was passing through town on his way to the north. I found him very ill, suffering intense pain in the stomach, vomiting everything he took, and passing black motions, consisting of fluid and solid matters, the latter composed partly of broken-down scybala and partly of black gritty powder. The pulse was weak, and the tongue red and thinly covered with a brownish fur. The superficial arteries were markedly atheromatous. I asked to see the matters vomited, and found them to consist wholly of the farinaceous foods which had been given him; but on the surface of the vomit I noticed a few small patches of brownish scum, which, on closer examination, appeared to consist of mucus stained with blood. I removed these, and, together with my friend Dr. Lionel Beale, examined them under the microscope; and we found, entangled in a fibrinous coagulum, numerous large nucleated cells precisely like cancer cells.

The more urgent symptoms yielded rapidly to appropriate treatment. I limited his food at once to animal jellies and fluids, such as could be completely or chiefly absorbed in the stomach, and forbade entirely the use of farinaceous food, which would have to pass out of the stomach before they could be digested. This obvious precaution was attended with immediate and entire relief of the vomiting. The rest of the treatment consisted in the use of creasote, lime-water, hydrocyanic acid;

still, also, the hypodermic injections of morphia, to relieve the severe pain; but these were now alternated with doses of chloral and bromide of potassium combined, which quieted his nervous system and procured sleep. Thus we were able to diminish considerably the amount of morphia employed. He recovered rapidly from all the symptoms, except the gastric pain, which I noticed again and again was rarely or never absent, except when it had been quieted by the hypodermic use of morphia. Under these circumstances his friends objected to accept the very unfavorable prognosis I felt bound to give, and I was repeatedly urged to adopt the gall-stone theory as sufficient to account for all his symptoms. Three or four dark-looking, irregular concretions were produced which had formerly been passed, and which we were told were gall-stones. These were submitted to analysis, and were reported to contain no cholesterol, and "to present more the character of urinary than biliary calculi." I had the advantage of consultation with two very eminent physicians, and they both felt uncertain as to the precise nature of the case, and were both more disposed than I was to give weight to the evidence in favor of gall-stones as the "*fons et origo mali*," as the patient was fond of expressing it. At any rate he rapidly mended, and left London about the end of June for the north. About six weeks later I heard from him, to the effect that he was much better, that he had "turned the corner," and that he was about to start the following day for Sweden. His brother-in-law, however, wrote to me that "he thought him in a bad way when *not* under the influence of morphia."

The sequel of this case is told in the following report of his last fatal illness and the post-mortem examination by Dr. C. Forsenius, of Gothenburg:—

"Mr. —, sixty-two years old, arrived at Gothenburg, in Sweden, from the little bathing-place Särå, on the 29th of August, 1874, in a comparatively good state of health. The sea-air and the voyage excited an unusual appetite, for which reason he took a rather copious breakfast, and ate also afterwards a good dinner. The same day, at 11 o'clock in the evening, he was suddenly affected with pain in the stomach and sickness. In the night he made a subcutaneous injection of morphia (84), and fell asleep. I was called at 4.30 A.M., and found him then in a soporose state, with very dilated pupils, with a scarcely perceptible pulse of about 130 beats in the minute, with cold bluish hands and feet, with the belly very swelled, hard, and tympanitic. I then at once considered it to be a peritonitis from a perforating ulcer of the stomach, and ordered only to put a flannel moistened with oil and turpentine and a warm poultice on the belly. At my next visit, between 10 and 11 o'clock in the forenoon, he was in agony, and died soon, very quietly. On the 31st August, 80 hours after death, I made a post-mortem examination in company with Dr. Ewart, and we found then all signs of death, the body exceedingly meagre, the belly very swelled, the intestines covered with a viscid lymph, distended by gas, and in the upper part lively red; the ventricle, or stomach, very large and dilated, had a hole or perforation in the minor curvature, near the cardia, of round form and with rounded edges, of about the size of a sovereign, which had been covered by the underside of the liver, to which it had been lightly adherent; its mucous membrane was grayish and

sloughy, with dark spots and striae of extravasated blood. The pylorus and the upper part of the duodenum were indurated and contracted, so that only the end of the little finger could be enforced in the passage, and the wall was there nearly half an inch thick. The liver was rather diminished in size, more dark and dense than usual. The gall-bladder was enlarged, as also the gall-duct (choledochus), but contained at present no gall-stone. The head of the pancreas was also somewhat enlarged and indurated as the surrounding duodenum. The heart was of diminished size and contracted, empty from blood; its mitral valve was white and a little thickened; the aortic valves were ossificated, and the aorta was dilated to the double of its natural size (aneurisma), with many small atheromatous patches on its inner side. The lungs were otherwise healthy, but had in the agony been cedematous. There was also in the serous sacs of peritoneum, pleura, and pericardium, yellow, watery exudations. He had even very large hæmorrhoidal piles yet bleeding after the death."

I am much indebted to Dr. Forsenius for this careful and excellent account of the post-mortem examination.

The issue of this case possessed very great interest for all those who had seen the patient professionally during life, and were acquainted with his medical history, and it seems to me that there are many points of general interest to be noticed in it.

In the first place, it shows that scirrhus disease of the stomach may run a very protracted course, extending over a long series of years, and that the patient may enjoy long intervals of apparently perfect health. This latter fact was strongly dwelt upon by one of the physicians whom he consulted as a counter-indication of the existence of malignant disease. Here seventeen years elapsed between the first onset of gastric troubles and the fatal illness. In the second place, we learn the striking efficacy of judicious treatment in relieving the symptoms attending this disease. The benefit derived from the Carlshad course was remarkable, and lasted for some time. We can easily understand how a carefully restricted diet, and a daily washing out of the stomach and intestines with large quantities of warm, alkaline, aperient fluid should have the effect.

The hypodermic injection of morphia doubtless also contributed much to the patient's comparative comfort, although it at last lulled him into a false sense of security, masked important symptoms, and induced the most careful clinical observers (who had not the same advantages that I had of watching him from day to day) to hesitate to give an entirely unfavorable prognosis of the case.

The immediate cessation of the gastric irritation and vomiting on the change from farinaceous food to animal fluids and jellies which could be absorbed in the stomach, was a strong indication of the existence of obstructive disease at the pylorus, and it points to a fact that is often overlooked in practice—viz., that in some conditions of gastric or intestinal disorder, soft farinaceous foods are by no means easy of digestion.

Another point of interest in this case was the supposed existence of gall-stones as the original and sole cause of the symptoms. This opinion was put before us with so much circumstantial de-



tail by the patient and his friends, and the success which had followed the treatment based on this opinion was pointed to as so evident; the actual passage of what were supposed to be biliary calculi; the long periods of freedom from suffering; the absence throughout the whole case of any local tumour or evident tenderness; all these facts naturally led us to give great weight to the considerations whether or not the symptoms could be thus satisfactorily accounted for. When, however, I observed the other obvious features of the case, at the time when I had the opportunity of seeing the patient daily, the constancy of the pain, except when under the influence of morphia, coming on the instant the effect of the morphia passed off, the striking change in the symptoms produced by the change of diet, the persistent appearance of black stools, and, above all, the presence of bodies, having a perfect resemblance to cancer-cells, in some fragments of mucus on the surface of the vomit,—these facts assured me that although gall-stones might coexist, or might have existed, we had to do with a case of malignant disease of the pylorus running a somewhat unusual course.

Protracted as was the course of this case, there seems to be good reason for believing that had this patient realised fully the serious nature of his malady, and been willing to remain under medical supervision and direction; had he, in short, adopted the habits of an invalid, taken only such food as was ordered him, instead of travelling about as a sound man, and eating heartily of any food he felt disposed, his life might have been prolonged much longer. As it is, I think the case an important and instructive one, as illustrating a probably not inconsiderable class of cases in which malignant disease of the stomach exists for many years before coming to a fatal issue.

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## ON AQUAPUNCTURE.

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In a paper read before the Scientific Congress at Nantes, in August last, Dr. Léopold Lafitte drew attention to the value of the subcutaneous injection of pure water for the relief of pain. He states that he was induced to try this simple remedy from having observed, when in Paris in 1872, the good effects produced by it in a case of acute rheumatism under the care of M. Dieulafoy. In the opinion of the author of the paper it is an expedient of great value, and he mentions many cases in which he had adopted it with marked success; one especially, a case of acute lumbago, was immediately relieved by the hypodermic injection of two grammes of pure water. Dr. Lafitte refers to an article in the "Nouveau Dictionnaire de Médecine et de Chirurgie Pratiques," entitled *Douleur*, by Mr. Georges Dieulafoy, as containing the only written account of this mode of treatment. In this essay, published in 1869, Dr. Dieulafoy concedes the credit of originating the treatment to M. Potain, and speaks enthusiastically of its efficacy. Indeed, after dismissing all other methods for the relief of pain in a few lines, he

devotes a whole page to the discussion of its merits. "D'après les expériences très nombreuses, que nous avons recueillies," he says, "voici ce qu'on peut avancer. Quand un individu est atteint d'une douleur, quelque soit son siège et quelle soit sa nature, on peut sans inconvénient combattre la douleur par les injections d'eau, et dans un grand majorité des cas le résultat est immédiat."

Subsequent to the publication of Dr. Lafitte's paper, Dr. Lélut has given his experience of the same treatment in a letter to *L'Union Médicale* of October 5th, 1875. His short communication is rendered interesting by an account of the incident which led him unwittingly to employ so simple an expedient. His servant had by accident overturned a bottle containing morphia in solution, which had been left upon his desk, and, wishing to conceal her misfortune, refilled the bottle with water. The following day Dr. Lélut employed the liquid from the bottle for a subcutaneous injection in a patient suffering from sciatica, in whose case he had previously injected morphia. The result was that the patient was relieved, and delighted to find the pain removed without the nausea and sickness that had been excited on former occasions. Astonished at the different effect produced by this injection, Dr. Lélut was led to examine the contents of the bottle, and was surprised to find that it contained only pure water. He repeated the experiment upon other patients, and found that it invariably gave them relief without inducing the unpleasant nausea caused by morphia.

Dr. de Laborde and others have also recorded their experience of aquapuncture in the same journal. A notice of Dr. Lélut's communication appeared in the *British Medical Journal* of November 27th, 1875; and was followed in the succeeding number by letters from Drs. Burney Yeo and Griffith claiming priority in the hypodermic use of water for the relief of pain. Both these gentlemen mention cases in which they resorted to this expedient with success in 1868. It is probable that this simple experiment has occurred to the minds of not a few. I can, for my own part, testify to its having been a common practice among the dressers at Guy's Hospital in 1867, who, in cases of supposed malingering or imaginary pain, were in the habit of substituting water for morphia. The relief that not unfrequently followed this practice used to be regarded by them as proof of the imaginary nature of the complaint—a deduction which the systematic experiments of MM. Potain and Dieulafoy would seem to prove incorrect.

In the following case of sciatica the subcutaneous injection of water was employed at my suggestion, and seemed to bring about a very rapid cure. The case is reported by Mr. Grimwood, and was under the care of Dr. Pye-Smith, to whom I am indebted for permission to publish it.

W. M—, aged fifty, a laborer, was admitted into Stephen ward, Guy's Hospital, on Jan. 6th, 1876. He was born of a healthy family, and has generally enjoyed good health, but at the age of sixteen he suffered from an attack of rheumatic fever. His father died of dropsy. He is a married man, and has four sisters living and healthy.

About twelve months ago, when working at the butts at Woolwich Arsenal, he one day got wet through. On the following day he went to work as usual, and worked until dinner-time, but on attempting to rise after dinner he experienced a severe pain

in the loins, which compelled him to go home to bed. He was attended by a medical man, and recovered after a time sufficiently to resume work of a lighter kind; but he did not lose entirely the pain in his left loin. He noticed that whenever he strained his left foot he was seized with cramp and suffered from a sensation as of pins and needles running up his leg. For about a month he has suffered from severe pain in his left hip, which is gnawing and continuous, but comes on sharper at some times than at others; it never entirely ceases. He also suffers at intervals from pain in the knee and on the dorsum of the left foot.

He is a tall, strongly-built man, with a ruddy countenance, but bears a pinched and anxious expression. He lies upon his back with his left leg drawn up and adducted, a position which gives him the greatest ease from pain. The percussion-note over the chest is good and the breath-sounds are normal; the heart-sounds are indistinct but clear; liver and spleen normal; tongue clean; appetite good; bowels regular. His urine yields a slight deposit, but contains no albumen or sugar; sp. gr. 1030. Temperature normal. He was ordered a mixture containing magnesia and sulphate of magnesia, to be taken twice a day, and a Dover's pill every night.

Jan. 11th.—The patient has not experienced any relief from the pain. A blister four inches square was applied over the sacro-iliac articulation, where the chief pain seems to be situated, and the following mixture was ordered to be taken three times a day:—Iodide of potassium, ten grains; bicarbonate of potash, ten grains; infusion of calumba, one ounce.

13th.—Patient has less pain in the hip, but has suffered pain in the leg and ankle this morning.

16th.—The pain in the leg and ankle is no better. A slight rash has come out upon his face, probably caused by the iodide of potassium. He feels well in health; temperature normal. Ordered a subcutaneous injection of a quarter of a grain of morphia every night.

17th.—The patient is better. He says he has no pain in the hip or thigh, and has pain in the foot and ankle, which he can move about a little.

18th.—A blister four inches in length by one in breadth was ordered to be applied along the course of the great sciatic nerve.

21st.—Patient is better. The pain is confined to the foot and half-way up the leg; it affects the big toe and the two next. He has had no coldness of the skin since the use of morphia injections, and says he can move the leg more freely.

24th.—The pain is less in the foot, and the patient can bend the toes, which he was unable to do before. He complains of pain of a darting character, which shoots from the heel into the groin. He has a slight headache to-day.

26th.—The pain in the hip and foot having returned, Dr. Pye-Smith desired that the patient should be examined by Mr. Lucas, who gave the following report: "The left leg is semiflexed and adducted. The muscles of the left leg and thigh, and those of the gluteal region on that side, are considerably wasted. The left leg below the knee measured three-quarters of an inch less than the right on the same level. No pain is excited by percussing the heel or great trochanter. The movements of the hip-joint are quite free, pain only being caused by extreme flexion; and this is probably due to stretching of the great sciatic nerve,

as he complains at the same time of a sensation of pins and needles down the back of his leg and foot. There is no thickening about the hip. There are some enlarged glands in the groin, produced, I have no doubt, by the irritation of the blisters. I believe the symptoms have their origin in the great sciatic nerve, and should recommend the subcutaneous injection of half a drachm of water three times a day."

The injections, which were of cold water and introduced into the arm, were given as follows: Jan. 25th, one at 9 P.M.; 26th, one at 4 P.M. and one at 9 P.M.; 27th, one at 10 A.M., a second at 4 P.M., and a third at 9 P.M.; 28th, one at 10 A.M.

He experienced relief from the first injections, and on the 28th was sitting up and quite free from pain. He says the injections first caused pain at the site of introduction, and were followed after a time by a warm perspiration and relief of the symptoms in the hip and leg. The injections were omitted on this day, and the following mixture was ordered to be taken three times a day: ten minims of dilute sulphuric acid, one drachm of compound tincture of chinchona, and an ounce of decoction of chinchona.

31st.—The patient has had no return of the pain. The glands in the groin are still slightly swollen. He left the hospital to-day, feeling quite well.

*Remarks.*—There can be no doubt that this man's sufferings were perfectly genuine. There was wasting of the muscles of the gluteal region, as well as of the leg and thigh of the affected side, and the leg was semiflexed and adducted. Moreover, the percussion and manipulation, to which he was subjected, evoked from him none of the exaggerated complaints that would most certainly have emanated from a malingerer; and, further, he throughout expressed himself as being desirous of returning to his employment.

It will be seen from the report that he had been severely blistered, had taken iodide of potassium regularly, and received an injection of morphia every night for some time; and under this combined treatment he had improved. But a return or increase in the pain induced Dr. Pye-Smith to ask me to examine the patient for more substantial disease. The effect of the injection of water was, according to the patient, to cause severe pain at the seat of introduction, followed by perspiration and relief of pain in the affected limb. It may be, as Dr. Pye-Smith suggested, that the cure had already been wellnigh effected, and that the injections simply distracted the patient's attention from the part. I intended that the injections should be inserted over the seat of pain, but it is perhaps as well that the misunderstanding which led to the introduction of the injections into the arm should have taken place, although it renders more difficult any attempt to explain the manner in which relief was brought about. Dr. Lafitte, injecting always over the painful spot, accounts for the relief afforded by supposing that the fluid introduced compresses the peripheral extremities of the painful nerves, and so brings about their temporary paralysis. It is evident that no such explanation is applicable to the foregoing case, as the injections were introduced at a distance from the seat of pain. There remain but two other ways of explaining the effects produced: either the local irritation causes such central excitement as to dull the perception of the sensorium to lesser pains, or the effect is throughout a mental one, which may be

compared to the relief sufferers from toothache so often obtain on approaching the house of a dentist. The explanation of the result, however, is of less consequence than the result itself, and may be allowed to wait until a certain consistency of effect has been established as occurring from the simultaneous use of water. It is scarcely to be expected that all pains may be equally relieved by this one method, as Dr. Dieulafoy asserts. Numerous failures must surely occur; and, if I might forecast the verdict of the future, I would anticipate that nerve-pains—neuralgias, sciatica, and the like—are more likely to be relieved by the remedy in question than the sufferings incident to chronic progressive diseases, such as cancer. As to the manner of injection and quantity of fluid to be introduced, Dr. Dieulafoy recommends that the seat of greatest pain should be searched for, and eight or ten drops of water be there injected. This, he says, may be repeated ten, twelve, or fifteen times at one sitting, if necessary. Dr. Laftie, in a letter to *l'Union Médicale* of Oct. 5th, 1876, says that he injects two grammes and then waits a couple of minutes, and if the pain be not relieved he then injects two grammes more. Even five or six syringefuls may be sometimes injected. He thinks that less than two grammes or more than ten should never be injected. He further insists strongly on the necessity of injecting over the painful part: "*Le seul point important à noter et à retenir c'est de faire l'injection au point douloureux. Tout le secret d'une bonne opération est là.*" The operation itself is so simple and so entirely free from danger that positive proof or disproof of its efficacy in relieving pain ought soon to be accumulated.

In conclusion, if the foregoing case should lead to an impartial and systematic investigation of the value of acupuncture, in England, the object of its publication will be accomplished.

St. Thomas's-street, S.E.

## NOTES ON THE SURGERY OF THE GENITO-URINARY ORGANS.

By FURNEAUX JORDAN, F.R.C.S.,

Professor of Surgery at Queen's College, Birmingham; Surgeon to the Queen's Hospital; Consulting Surgeon to the Women's and West Bromwich Hospitals.

### I.—ON THE RETENTION OF BOUGIES INSTEAD OF CATHETERS FOR THE CONTINUOUS DILATATION OF STRICTURES.

AMONG the various methods of treating stricture of the urethra, that of continuous dilatation is justly held in much esteem. In a few days, and with no risk, a very tight stricture may be dilated so as to permit a large instrument to be passed; hence the treatment may be said to combine the safety of gradual dilatation with the rapidity of incision or rupture. It is not suited to every case. It will not, for example, take the place of internal division in strictures anterior to the scrotum, nor of external division in persistent fistulae. In a large number of tight—perhaps very tight—old and neglected strictures, with no great irritability or resiliency or attendant induration, the surgeon is glad to get in a fine instrument and leave it in.

Although it may require much patience and skill

to introduce the finest bougie, the general custom is to withdraw it and attempt the introduction of a catheter. The effort occasionally fails, and much valuable time is lost. Now, in such cases I have for several years kept in the fine or filiform bougie, and directed that the urine should be passed from time to time by its side or around it. In every instance in a large number of cases this has been easily done, micturition, as a rule, actually being easier and in a larger stream than when the bougie is out. In twenty-four hours a goodly-sized bougie (not catheter) can be introduced. On the third day I usually put in a No. 12 or even No. 13 bougie or catheter. It is of course in the earliest stages that the superiority of the bougie over the catheter is seen.

The advantages of the treatment I have just described are these:—A more rapid and complete dilatation, due to the hydrostatic pressure of the urine along the exterior of the bougie; a bougie is more easily introduced than a catheter; when the finest bougie is once in, it need not be taken out—no slight boon; the ordinary acts of micturition are preserved; every kind of apparatus for keeping the bed dry, or for any other purpose, may be dispensed with.

### II.—ON THE RESULTS OF CONGENITALLY SMALL URINARY MEATUS IN MALES AND FEMALES.

These results I briefly pointed out a few years ago. Further experience teaches me that the congenital defect in question is a frequent cause of otherwise obscure urinary ailments. The natural meatus in the male extends from the centre of the glans to near the meatus. An opening in the centre of the glans a line or two in length, looking as if it would scarcely admit a pin's head, is practically a stricture, and may give rise to almost all the results of stricture. I not infrequently meet with the cause and the effects. In boys, a common result is cystitis simulating stone in the bladder. Boys, however, often escape notable trouble; as men they are not let off so easily. With the cares, indigestion, gout (disguised or open), and other ailments which increase the acidity of urine, there come one or several of the results of stricture. One such effect is urethritis, which, by continuous extension, may lead to prostatitis, or cystitis, or epididymitis. There are some surgeons who, under these circumstances, would affirm that the urethral inflammation had been caused by the contact of some noxious fluid. I will not here discuss the merits or demerits of a policy of uniform incredulity. My answer is this: Often in cases of diminutive meatus the bladder is affected first, then the prostatic urethra, then, perhaps, the inflammation may extend along the vas deferens, setting up consecutive orchitis, and from first to last there is no urethral discharge. I remember that in one week there came under my notice, by curious coincidence, four cases of epididymitis having no other cause than small meatus, and resisting all treatment, except the incision of that aperture.

Very frequently the symptoms are confined to the bladder. Frequency of micturition, suprapubic pain, mucus or blood in the urine, are, singly or combined, the subject of complaint. It is remarkable how single symptoms of cystitis may exist, especially when due to the milder causation of a small meatus. A clergyman was sent to me with a very obstinate ailment, but it consisted

of one symptom only, supra-pubic pain. A young man during a period of ill-health, marked by great acidity of urine, had one bladder symptom only, hæmaturia. Both men had a small meatus.

A diminutive urethral orifice aggravates and prolongs a gonorrhœa, or gleet, or stricture, and their ordinary sequelæ.

The treatment I adopt for small meatus and its resulting ailments is an incision downwards towards the frænum made with a concealed bistoury. The result has been in all cases—a large number—successful. The success is not always rapid, especially in old-standing cases of cystitis; but sooner or later relief follows.

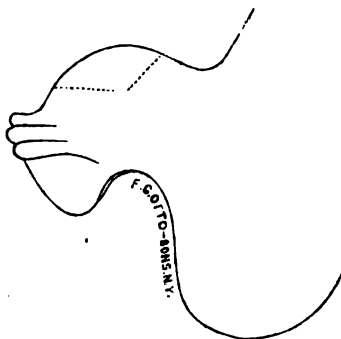
It is natural that the shorter and simpler urethra of females should less frequently be associated with vesical distress. Now and then, however, both in young girls and women, we meet with cystitis of a seemingly inexplicable character. In such cases I have found a markedly small meatus. Whether the urethra itself has been smaller or not I have not been able to decide, but I strongly suspect that the mischief lies mainly at the orifice. In dilating the urethra with the finger there is a feeling at the meatus as though a thin thread were tightly tied round even a small finger. It would seem that when the urinary outlet falls below a certain (perhaps a relative) size, bladder trouble begins. A small meatus in women, as in men, may give rise to few or no symptoms if the general and uterine health be good. But in women, as in men, a constricted urinary outlet is often, not the last, but one of the feathers which break the camel's back. Hysteria is probably present in some of these cases, but it is not likely to affect little girls, and it does not explain all the bearings of the cases of adults. Hysteria is often a lofty and ostentatious fabric, but underneath it there is a real, though a slight, pathological or physiological foundation. I have met with the cystitis now spoken of oftener, but not invariably, in young girls and in adults than in young women. The greater acidity of urine in children, and the greater "worry" of women, may perhaps explain this.

The symptom which in females overtops all others is frequency of micturition; other symptoms may be slight or absent. In obscure cystitis in women it has occurred to several surgeons to dilate the urethra with the finger or a dilator. For several years I have adopted this treatment with fair success. In some cases it fails or succeeds only for a time. In future, I intend in these cases to incise with moderate freedom the meatus, and, if need be, the adjacent portion of the urethra. I purpose making the incision upwards with a concealed bistoury, the blade being projected after the bistoury is introduced to a fixed and definite degree, and drawing the blade along the whole urethra. The urethra will be divided only where it is contracted, if indeed it be contracted at all.

### III.—A SIMPLE OPERATION FOR THE RELIEF OF CONGENITAL CURVATURE OF THE PENIS, WITH HYPOSPADIAS.

Cases of imperfect development of the spongy body of the penis, in which there is more or less hypospadias, curvature of the penis, and attachment of the scrotum to the frænum, are not very rare. When the curvature is markedly present during erection, sexual union is impossible. A case of a severe character was brought to me where marriage had been a rite only, not a fact—

where many surgeons had been consulted and many kinds of advice had been given and taken, but in vain. I regarded the "dissecting operation" as complicated in method and unsatisfactory in results, and as necessarily increasing the hypospadias, and thus lessening the chances of fertile marriage. Having explained to the patient, without giving too hopeful a view of the result, the nature of the operation I am about to describe, he readily gave his consent. I cut a large wedge-shaped slice out of the centre of the dorsum of the penis (see woodcut), and freely removed portions of the cavernous bodies. I assumed, and justly, as the event proved, that the portions of the cavernous bodies left below the excision would suffice to preserve the power of erection. I put in a few deep stitches, and directed the penis to be kept against the wall of the abdomen—a now possible and easily maintained position. The bleeding at the time, and some recurrent bleeding, were not more than is to be expected in severe wounds of the penis. The stitches cut their way out before union was obtained; but strapping and position



were followed by an excellent result. The man's surprise at the new position of his penis was even greater than his delight. He left the hospital, saying, to those interested in his case, that his penis during erection "turned upwards instead of downwards."

### IV.—A MORE EFFECTUAL METHOD OF APPLYING IODINE TO THE INTERIOR OF CERTAIN CYSTS.

I have found that there are in practice two classes of scrotal hydroceles, in which the ordinary methods of treatment are either difficult to use or uncertain in their result. In boys and men there are occasionally encysted hydroceles of the testis, or the cord, which continue to increase in size, or in which treatment is urgently requested. In such cases, except in early infancy, acupuncture or the use of a fine trocar often fails to cure. The walls of the cysts are usually thin, and collapse so much when their contents are withdrawn that the injection of a fluid is uncertain. The end of the canula may be outside the cyst, and the iodine solution be consequently injected into the connective tissue at its exterior. In such cases the following is a reliable method of treatment:—The cyst being well isolated, made tense, and brought near the surface, I pass through its centre a stout needle, armed with silk, and leave the threads hanging. The fluid quickly oozes away, especially if a little traction be made on the threads. I then, at one opening, wet the threads with iodine liniment (liniment because the quantity required is so limited) and

draw the threads so as to leave moistened portions within the cyst. A little gentle friction will help to spread the iodine thoroughly over the lining membrane of the cavity. An hour later freshly moistened portions may again be drawn through if the cyst be large, or if other methods of treatment have failed. On the other hand, in a very small cyst a single thread, moistened and kept in one hour, will suffice.

Another class of cases are those of simple vaginal hydrocele, in which the injection of iodine and other ordinary methods of treatment are unsuccessful. An interesting case will best convey what I wish to say. A young man had a moderate-sized hydrocele. Trocar puncture, and acupuncture repeated a few times failed, and consequently iodine tincture (undiluted) was injected. In a few weeks the collection had reached its old size. A silver-wire seton was then put in; while in, the cyst remained empty, but its removal was followed by reappearance of the fluid. I then, at three o'clock, passed through the cavity a double silk thread at two spots. In a few minutes, when all the fluid had oozed out, I drew the threads, moistened with iodine liniment, into the serous cavity. I directed him to repeat the process in an hour. He was so anxious to get well—he was shortly to be married—that he moistened the threads four times in six hours. At midnight the effects had become so sharp that he was glad to remove the threads as he had been directed. He remained at home one day only, and was shortly and permanently well.

I venture to believe that no kind of hydrocele will resist this method of applying iodine, and consequently that the setting up of suppuration, even as a last resort, can rarely be necessary.

## CONTRIBUTIONS TO AURAL SURGERY.

By W. B. DALBY, F.R.C.S., M.B. Cantab.,

Aural Surgeon to St. George's Hospital.

### NO. III.—CLOSURE OF THE EXTERNAL AUDITORY MEATUS.

PARTIAL or complete closure of the external auditory meatus, although not a very common condition, is one which occasionally calls for surgical interference. The tissues by which this canal may become closed are either bony, in the form of so-called exostoses, or connective in one of two forms: firstly, as congenital closure; and, secondly, as a firm cicatrix at the opening of the ear. This latter condition is at times induced by a long-continued profuse discharge from the external meatus, due sometimes to a perforation of the tympanic membrane, at other times when this membrane is entire. The external part of the ear becomes inflamed, and the opening, so to speak, skins over, leaving a small hole just large enough perhaps to allow the passage of a small probe. When this state becomes permanent, in addition to the disfigurement which it causes, such an aperture is obviously too small an inlet for the passage of sound to the tympanum; and how difficult it is to restore the opening to the auditory canal is sufficiently well known to those who have made the attempt. Dilatation, however practiced, produces

only a very temporary effect. For example, if this dense tissue be freely cut through, say by a crucial incision, the flaps turned outwards, and the opening thus made be carefully plugged with lint and dressed daily, it will close in a few days after the dressing is discontinued as firmly as before. Sponge tents, pieces of gum-elastic catheter, and a variety of other expedients have from time to time been used with a view of keeping the opening patent; but such attempts have, so far as I know, universally failed. The extreme difficulty then, so generally experienced in this respect, makes the following case especially worthy of attention, as the results of the plan employed proved most satisfactory.

In February, 1875, a young lady aged twenty-nine applied to me under the following circumstances. In the middle of the previous October, she, being in good health, was seized with acute pain in both ears. This lasted five or six days, and was succeeded by a purulent discharge from both ears and cessation from the pain. After this the suppuration continued to be profuse, and there was occasionally some return of the pain, for the relief of which poultices were very frequently employed. It was during this period that the external openings of the ears, being subjected as they were to the irritating influence of the discharge, became inflamed, covered with granulations, and, lastly, were the seat of cicatricial tissue; in other words, the tragus on either side having been lost by ulceration, the openings of both ears skinned over, leaving, however, a minute hole (large enough to admit an eye probe), through which from time to time oozed a thin purulent discharge. The deafness on both sides was extreme. From the history of the case, it would be supposed (although this supposition eventually turned out to be incorrect) that the tympanic membranes were perforated. Both sides were treated in the same way. The patient was placed under the influence of ether. Taking the small orifice above mentioned as a centre, a free incision was made upwards, downwards, inwards, and outwards, and the opening thus made plugged with lint. On the next day the lint was taken away and replaced by pure lead contrived as follows: A piece of thin lead sheeting was rolled until it was of a size that exactly fitted the canal, and was then inserted to the depth of about three-quarters of an inch. The plugs were removed night and morning, the ears were syringed, and the plugs replaced and kept in position by a bandage round the head. In the course of ten days the rim of the openings had cicatrised around the lead; the canals were of their natural calibre, and an examination of the tympanic membranes became possible. It was then found that they were entire. There was no further discharge from the ears. The difficulty in the management of the case now began, for it was found that if the lead was allowed to remain out of the ears for even half an hour the meatus became swollen and painful, and there was the greatest difficulty in replacing the lead. This curious condition was so marked that the patient one night took out the lead at 10 o'clock, syringed the ears, and by my desire left out the lead till 11 o'clock. She then found that she was unable to replace it, and came at 12 o'clock to me, when I was obliged to use considerable force, causing great pain, before I could reinsert the lead. For more than two months the patient used the greatest care in managing the re-

placement of the lead after it was taken out of the ear, very gradually increasing the periods during which she left the ears without the plugs from ten minutes to twenty, and so on up to four or five hours. At the end of two months the openings were considered to be permanent, and the ears were left unmolested. Four weeks after this, having left London, she awoke one morning feeling great heat and pain in the left ear. She attempted to put in the lead, and failed. Ten days later she came up to town again, with the ear in precisely the same condition as before the operation, the right ear, however, continuing well. To make a long story short, so far as the left ear was concerned, all the same trouble as before was gone through. She made a good recovery, and both meatus have since remained normally patent.

In connexion with this case I would here suggest the question, Might not a similar procedure be adopted in those cases of congenital closure of the meatus where a very considerable degree of hearing is present—i.e., where the deviation from normal hearing is no more than would be caused by the connective tissue which separates the external auditory meatus from the outer ear? Congenital closure of this passage is, as a rule, accompanied by complete deafness, and then is doubtless coexistent with some other defect in the auditory apparatus; but this is by no means always the case, for I have on several occasions seen instances where the hearing has been so good as to admit of the acquirement of speech in young children, and such an extent of hearing in very young children means a very slight degree of deafness.

Even more difficult of management, and at times more urgently calling for interference, than any of these examples of closure of the external auditory canal, are those in which bone forms the obstacle to the passage of sound: cases of so-called exostosis. Bony growths in this situation are far more frequent than is generally supposed; and this may readily be imagined when, from Oct. 1874 to Oct. 1875, no less than fourteen cases came under my observation in private practice, in eight of which one ear only was affected. These growths are, more often than not, multiple—i.e., in the same meatus, where there is one there are generally more. And it is a remarkable fact that, although exostoses are met with in one ear alone, it not unfrequently happens that both meatus are affected similarly, not only in respect to the presence of these tumours, but also as to their size and number. Thus I have seen three large growths so nearly meeting in the axis of the canal as to wellnigh obliterate the passage, and on examining the other ear have found an exact counterpart. That small bony enlargements in the external auditory canal are sometimes congenital I feel tolerably confident, that they remain without any perceptible change in size for many years I have satisfied myself beyond question, and that they should at one time increase synchronously (as they undoubtedly do) in either canal, and at another affect one ear only, is at least interesting, if not capable of explanation. It would seem that they are at times called into existence by an irritation, so to speak—by the irritating influence of a discharge coming through a perforate tympanic membrane and constantly passing over the meatus; at least, such an explanation appears not so improbable when an exostosis is found in the ear so affected, whilst the other (a healthy ear) is free from these growths; but, on the

other hand, such a theory will not hold true when the ear in question is to all appearance and shown by all known tests to be in perfect health, save the bony enlargement itself. As to Mr. Toynbee's theory of their gouty origin, it is hardly necessary to revert to it, except to say that experience amply proves its fallacy.

In place, however, of speculations as to the origin of bony enlargements in the part under notice, it is more useful to consider what is the best to be done when they become the source of inconvenience and trouble. Very often for many years they remain unnoticed until a little cerumen completes the closure of the already partially closed canal, and the consequent deafness directs attention to the ear. So long as the meatus can be kept clear of secretion by oft-repeated syringing, it is undoubtedly better not to interfere any further; but there are two conditions under which an attempt should be made to remove these growths,—1st, when behind the exostosis there is a perforation of the tympanic membrane, a polypus growing from the living membrane of the tympanum (the protrusion of some part of the polypus beyond the exostosis will afford evidence of its existence), and thus preventing the free egress of discharge from that cavity, inducing symptoms of cerebral irritation, and so threatening life; 2nd, when the exostosis, by completely closing the auditory canal, causes intense deafness.

The removal of exostoses in the external auditory canal is beset with difficulties. The very position of the growths makes it necessary that all work must be done under light reflected from a mirror worn on the forehead of the operator. To keep this light steady, the patient's head must be absolutely motionless, and the surgeon's head must be so as well. Again, the size of the canal not only limits the movements of instruments, but also their use to but few, and any bleeding checks all proceedings until such bleeding can be stopped. Moreover, the intense hardness of the exostosis does not facilitate matters. There are two modes of operating which are deserving of especial mention. The first was originally suggested and successfully practised by Dr. Thos. E. Clarke, of Bristol, in 1873, in a case of a large exostosis which almost filled the meatus. Three needles were introduced into the growth, two at the base and one at the anterior edge. Through these needles a continuous current of electricity from six pairs of plates of a Stöhrer's battery was passed for three minutes. Fourteen days afterwards this was repeated; and three weeks later the growth was so loose as to be readily extracted, and the patient made a very good recovery. Since Dr. Clarke's case was published, in adopting similar measures, owing to the extreme hardness of the bone, I have found it convenient to drill holes into the base of the tumour to permit of the introduction of the needles; and I can testify to the success which attends this plan of removing bony growths. But I have to relate a most unfortunate mishap which occurred upon one occasion, when every precaution (so far as could be foreseen) was used. The case was one in which there was a polypus behind the exostosis, and unpleasant symptoms of cerebral irritation made the operation necessary. Two needles were inserted at the base of the tumour, and the current was passed for two minutes. The patient, a healthy man thirty years of age, suffered a good deal of pain during the

right after the operation; and on awaking the next morning the facial muscles on the side operated upon were paralysed. This happened in November, 1874, and the power of movement up till now has been only partially regained. This accident must have occurred from one of two causes: either it was the immediate consequence of the electricity as applied, or else it was due to inflammation in the tympanic cavity set up by the operation. For myself, I am satisfied that the latter explanation is the correct one. We know how frequently acute inflammation in the tympanum will produce paralysis of the muscles supplied by the portio dura, affecting as it does that part of the nerve in the aqueduct of Fallopius; and we do not as yet know that an electric current passed as was done in this case (so that the course of the current was at a considerable distance from the nerve) is capable of causing such an effect; and again, if the current had immediately paralysed the muscles, the paralysis would have occurred during the operation, and certainly on the evening of the day of the operation there was no facial paralysis. I have thought it right to publish this account that it may serve as a caution in the future to others besides myself in dealing with similar cases, but how far we shall be justified in abandoning this method of treatment because an unfortunate accident happened in a single case, each one must judge for himself. The removal of exostoses in the external auditory canal is not sufficiently common to supply a very large experience, but I must confess to have kept on the safe side since this case, and to have employed another method, which is entirely free from the slightest risk of any like catastrophe. It consists in grinding the bone away, and the most satisfactory appliance for this purpose I find to be the drill which is in common use among dentists. The variety of steel instruments which can be fixed to this, and the perfect command with which the instrument can be directed, render this an especially convenient instrument. Reflected light of course must be employed, the patient must be made insensible to pain, and a third person must turn the lathe, or cease turning, according to the directions given him at the time; with such precautions I know of no such ready method of destroying these bony growths when their removal becomes imperative.

### THE TREATMENT OF ACUTE RHEUMATISM BY SALICIN.

By T. MACLAGAN, M.D.

A PERUSAL of the literature which bears on the question of the treatment of acute rheumatism is a task from which few would rise with any definite idea as to how that disease is best treated. Purgatives, diaphoretics, sedatives, alkalies and alkaline salts, colchicum, aconite, quinine, gualacum, lemon-juice, sulphur, mercury, veratria, tincture of muriate of iron, &c., would each be found to have in turn attracted the favorable notice of one or more of those who have directed attention to the subject. Of all these different remedies, not one stands out prominently as that to which we can with confidence look for good results. "Each and every

plan of treatment which has been hitherto proposed is regarded by the profession as unsatisfactory."<sup>\*</sup> In accordance with this impression, we find eminent and trustworthy physicians treating the disease on a purely expectant plan—that is, not giving drugs at all, and apparently with results as satisfactory as those which follow the administration of any of the usual remedies.† We have, indeed, no remedy for acute rheumatism—a malady which not unfrequently proves fatal, which is always accompanied by great pain, and is a fruitful source of heart disease.

Under these circumstances, I need make no apology for bringing under the notice of the profession a remedy which, so far as my observations have gone, has given better results than any which I have hitherto tried, and I have tried all the usual remedies over and over again.

In the course of an investigation into the causation and pathology of acute febrile ailments, which has for some time engaged my attention, I was led to give some consideration to intermittent and to rheumatic fever. The more I studied these ailments the more was I struck with the points of analogy which existed between them. On a detailed consideration of these I shall not now enter. Suffice it to say that they were sufficiently marked to lead me to regard rheumatic fever as being, in its pathology, more closely allied to intermittent fever than to any other disease, an opinion which further reflection and extended experience have served only to strengthen.

Rheumatic fever is now-a-days generally regarded as being produced by some cause or agency which is generated within the body. My own investigations into its pathology have led me to reject this view, and to adopt the old "miasmatic" view of its mode of origin, according to which the cause which gives rise to the disease is introduced into the system from without.

Holding this view as to the pathology of rheumatic fever, impressed with the points of resemblance between it and intermittent fever, and bearing in mind that we have in quinine a potent remedy against the latter, there seemed to me good reason for indulging the hope that some remedy would yet be discovered capable of exercising a similar, if not equally beneficial action on rheumatic fever.

In reference to the action of quinine on the various forms of intermittent and remittent fever, and, indeed, with reference to the action of the Chinchonaceæ generally on the diseases of tropical climates (ipécacuanha in dysentery, for instance), there is one fact which has always strongly impressed me—the fact, namely, that the maladies on whose course they exercise the most beneficial action are most prevalent in those countries in which the Chinchonaceæ grow most readily; nature seeming to produce the remedy under climatic conditions similar to those which give rise to the disease.

Impressed with this fact, and believing in the miasmatic origin of rheumatic fever, it seemed to me that a remedy for that disease would most hopefully be looked for among those plants and trees whose favorite habitat presented conditions analogous to those under which the rheumatic miasm seemed most to prevail. A low-lying, damp lo-

\* Aitken's Practice of Medicine, sixth edition, vol. i., p. 819.

† Dr. Garrod in Keynold's System of Medicine, vol. i., p. 906.



cality, with a cold, rather than warm, climate, give the conditions under which rheumatic fever is most readily produced. On reflection, it seemed to me that the plants whose haunts best corresponded to such a description were those belonging to the natural order Salicaceæ, the various forms of willow. Among the Salicaceæ, therefore, I determined to search for a remedy for acute rheumatism. The bark of many species of willow contains a bitter principle called salicin. This principle was exactly what I wanted: to it, therefore, I determined to have recourse. It will thus be seen that the employment of salicin in the treatment of acute rheumatism was no haphazard experiment, but had a fair foundation in reason and analogy.

Salicin has long enjoyed a reputation for tonic and febrifuge properties, and was at one time a good deal used as a substitute for quinine. It has, of late years, however, gone very much out of use, and now it does not even find a place in the British Pharmacopœia.

The idea of treating acute rheumatism by salicin occurred to me in November, 1874. I had at the time under my care a well-marked case of the disease (Case 1) which was being treated by alkalies, but was not improving. I determined to give salicin; but before doing so, took myself first five, then ten, and then thirty grains without experiencing the least inconvenience or discomfort. Satisfied as to the safety of its administration, I gave to the patient referred to twelve grains every three hours. The result exceeded my most sanguine expectations. For some days prior to its administration the temperature had ranged from 101·8° to 103°; the pulse was 120, and the joints were swollen and very painful. On the 26th of November the alkaline treatment was stopped, and that by salicin commenced. On the following day, after eighty-four grains of salicin had been taken, the pulse had gone down to 100, the temperature to 99·6° (from 102·8° the previous day), a fall of over 2°, the pain and swelling of joints, but especially the pain, had much abated, the joints could be moved a little, and the patient expressed himself as being much better. On the next day (Nov. 28th) the temperature was natural and the pain all but gone, the joints still remaining stiff. From this time he convalesced steadily and quickly.

The case was a very striking one; but, by itself, could not be regarded as proof of the beneficial action of salicin. I was quite aware that cases of acute rheumatism do sometimes unexpectedly improve without any treatment, and had no surety that this was not a case in point. It afforded me, however, strong encouragement to persevere with the salicin. This I did; and all the cases of acute and subacute, and several of the cases of chronic, rheumatism which have come under my care since then have been treated by this remedy, and with results much more satisfactory than I ever got from any other remedy,—the results being most marked and most satisfactory in distinctly acute cases, and least so in chronic cases. Subjoined are the details of eight cases; four acute, three subacute, and one chronic.

**CASE 1. Acute rheumatism.**—William R—, aged forty-eight, was first seen on Nov. 24th, 1874. Had rheumatic fever eight years ago; was then confined to bed for eight weeks. With that exception has always enjoyed good health. Present illness commenced three days ago with shiver-

ing and pains in joints, which have increased in severity.

Nov. 24th.—Has anxious, pained expression. Lies on his back without power of motion, the least movement causing intense pain. Skin covered with acid perspiration; tongue moist and furred; bowels moved by medicine; urine scanty and high-colored: pulse 120, small and regular; temperature 101·8°; heart's sounds normal. To have twenty grains of acetate of potass every four hours, and ten grains of Dover's powder at bedtime. Food to consist of milk, beef-tea, and light puddings.

25th.—Passed an almost sleepless night. General state unchanged. Has great pain in the joints, especially in the knees, ankles, wrists, and fingers, which are all a good deal swollen. Cannot move. Pulse 120, feeble; temperature 103°; heart's sounds a little muffled; skin bathed in acid perspiration. Continue treatment.

26th.—Had an hour's troubled sleep after the Dover's powder. No change in general condition; lies on his back, quite unable to move; profuse perspiration; pulse 120, feeble; heart-sounds indistinct; temperature 102·8°. Omit potass and Dover's powder; to have twelve grains of salicin every three hours.

27th.—Had four powders (forty-eight grains) before bedtime yesterday. Passed a much better night; slept for several hours in snatches of an hour at a time. Expresses himself as feeling much better, and looks so; says the powders did him a deal of good; can move his limbs a little, but not without pain; joints less swollen; skin covered with acid perspiration; tongue furred; bowels not moved; pulse 100, of better volume, soft and compressible; heart-sounds clearer; temperature 99·6°. Has had eighty-four grains of salicin. To continue it.

28th.—Had a pretty good night; pain nearly gone, though still felt on moving the limbs; joints almost natural in size, except those of the fingers, which are still swollen; skin not perspiring so freely; secretion still acid; tongue cleaning; bowels not moved. Pulse 84, of good volume and character; heart-sounds distinct and normal; temperature 98·5°. To have a dose of castor oil, and to continue salicin every four hours.

29th.—Passed a good night; pains quite gone, and can move the joints freely. Is loud in his praise of the powders, every one of which, he says, he felt do him good; wishes to continue them. Pulse 72; temperature 98·8°.

From this time convalescence was steady and satisfactory.

**CASE 2. Acute rheumatism.**—Mrs. B—, aged thirty-three. First seen on Dec. 18th, 1874. On Dec. 15th was seized with pains in hips and knees, for which she was compelled to go to bed. Had been shivering and feeling out of sorts for two or three days before.

Dec. 18th.—Complains of pain in both knees, and in left wrist, which are all swollen and tender; skin covered with acid perspiration; tongue furred; bowels moved by medicine; urine scanty and high-colored; pulse 116; temperature 101·6°. To have twelve grains of salicin every four hours.

19th.—Not much sleep; general condition unchanged. Pulse 116; temperature 102·2°. To take a powder every three hours.

20th.—Better night; feels much better; can move knees without pain, though joints are still

stiff; is quite free from pain; tongue cleaner; skin moist. Pulse 84; temperature 99°.

21st.—Feels quite well; only a little stiff. Pulse 72; temperature 98.5°.

Convalesced satisfactorily.

CASE 3. *Acute rheumatism*.—Henry B—, aged thirty-four, had rheumatic fever seven years ago; was ill at that time for six or seven weeks.

March 14th.—Two days ago felt generally out of sorts; at night felt cold and shivering and had aching pains in limbs, especially in hip-joints. Complains now of pain in right shoulder, both ankles, and left knee, the ankles and shoulder being most painful; all the affected joints are slightly swollen. Feels just as he did when his fever came on seven years ago. Has anxious expression; skin covered with acid perspiration; tongue thickly furred; bowels moved by medicine. Pulse 112; temperature 102.1°; heart's sounds normal. To have twenty grains of salicin every three hours.

15th.—Rather restless night; ankles and shoulder not so painful, but left knee more so; through some mistake did not have the powders during the night; free acid perspiration; pulse 120; temperature 101°. Continue salicin; heart's sounds normal.—Evening: Feels better; says the powders are giving him much relief. Pulse 100; temperature 99.8°. Continue salicin.

16th.—Passed a much better night; skin moist; tongue less furred; expression much improved. Pulse 80; temperature 98.6°. All the joints free from pain, though stiff and giving slight pain on motion.

17th.—Feels quite well. Pulse 68; temperature 98.2°.

(To be concluded.)

#### ON THE

### LOCAL USE OF COLD IN ABDOMINAL INFLAMMATIONS.\*

By PETER EADE, M.D. Lond., F.R.C.P.,

Physician to the Norfolk and Norwich Hospital.

THERE are few acute diseases with which we have to deal that cause us more anxiety during their continuance than the inflammatory affections of the abdomen. Though by no means common, they are frequently acute, and sudden in their onset; and their course, whether for weal or woe, is often short, sharp, and decisive. It is with this class of abdominal affections exclusively that I wish now to deal, and the few observations I desire to make will have reference only to these. They comprise peritonitis, enteritis, and the congestive inflammatory condition which follows upon obstruction of the bowels, especially under the use of purgatives. Of the milder forms of peritonitis, such as the strumous and the tubercular, or the adhesive form, which is generally local and is due to the neighborhood of some diseased viscus, I shall not now speak. I have no experience to bring before you of the local use of cold in their treatment,

and therefore, although it may occasionally be useful in such conditions, my present observations do not apply to these.

The title of this paper is, "The Local use of Cold in Abdominal Inflammations"; and I venture to bring the subject before you in connexion with some cases in which I have recently made use of this agent, with a very considerable amount of benefit to the respective patients. Of course I am well aware that such a use of cold is not only not new, but has been recommended with a varying degree of emphasis by various writers. But whatever the recommendations of our text-books, this I do say, that a consulting experience of now many years tells me that the almost universal practice of this district in this case of peritonitis or enteritis is to apply warm rather than cold applications to the abdomen; and that if I am called to see a case of either of these diseases, it almost (if not quite) never happens that the influence of cold locally to the abdomen has been brought into practical requisition.

I wish it to be distinctly understood that I am not now advocating the substitution of cold for warm applications to the abdomen in every case of inflammation,—I have not sufficient data to go upon to justify this; but I do desire to call, or perhaps I ought to say recall, the attention of this Society to the practical value, at least in some cases, of such practice; and the cases which I now briefly relate to you from my clinical experience will, I trust, suffice to induce a trial by you of this rather neglected agent in apparently suitable circumstances.

Before doing so, I will, as shortly as possible, place before you the present views of authors as to the proper treatment of these inflammatory abdominal affections; and, to save time, will only quote from three or four of those most commonly accepted as the guides of the profession at the present time.

To begin with Sir Thomas Watson, whose well-weighed words always command attention and deference. Speaking of simple acute peritonitis, he says the great remedies are rest, bloodletting, and opium. He adds: "After the leeches have fallen off, a light poultice may be laid over the abdomen; or it may be assiduously fomented with flannels wrung out of hot water, ..... and these are generally found to afford great comfort to the feeling of the patient. Cold applications have been recommended by some practitioners of high authority," as, for example, Dr. Sutton and Dr. Abercrombie; but he goes on to say, "I should think this a more precarious plan than the opposite, and I have always observed so much relief to be given by warm epithems that I have never had the inclination nor the courage to employ cold." Of inflammation of the bowels he says that it requires very much the same kind of treatment as peritonitis.

Dr. Wardell, writing in Dr. Russell Reynolds's "System of Medicine," article Peritonitis, after quoting Sutton, Abercrombie, and Smole of Prague, as having recommended cold compresses to the abdomen, and even injections of iced water, says: "Not having any personal experience of cold appliances, I shall not do more than mention a remedy to the success or otherwise of which I can bear no testimony. It would, to myself at least, seem of doubtful utility in many cases, and

\* Paper read before the Norwich Medico-Chirurgical Society.

one involving great risk in others; and I prefer what I believe to be equally efficacious, and certainly safer—namely, warm fomentations.”

Dr. Bristowe (art. Enteritis, “Reynolds’s System”) also recommends, after the application of leeches, “warm but light applications to the surface of the belly,” which, he says, “generally soothe, even if they produce no further beneficial effect.” And of the vomiting which ensues when the stomach and bowels become greatly distended, he says, if to this “over-distension there is no other channel of relief, medicine ceases to have any power over it.”

Dr. Tanner advises for peritonitis “sedative fomentations to be properly and assiduously applied,” either alone, or the abdomen having been previously covered with extracts of poppy and belladonna. He does not allude to the use of cold in the treatment either of peritonitis or enteritis.

Dr. Aitken says, leech, give opium, and apply warm fomentations, in peritonitis; and he recommends pretty much the same treatment in enteritis.

Dr. Copland says, if cold is applied to the abdomen at all, it should be in the early stage and in the acute form of peritonitis; but he prefers the external use of turpentine, and of fomentations.

Niemeyer speaks favorably of local bloodletting in peritonitis, and then says: “The employment of cold acts in the same way, and perhaps it has even more effect on the inflammation itself. If the patient can bear it—which, unfortunately, is not always the case,—we may cover the entire abdomen with cold compresses, and renew them every ten minutes.” And lastly,

Dr. Flint, of New York, says: “Warm fomentations to the abdomen, if grateful to the patient, are useful. . . . Cold applications are recommended, after trial, by Grisolle and Alison. I cannot speak of their utility from observation, but I should be willing to trust to the feelings of the patient in deciding between warm or cold applications.”

From these quotations it will be seen that though the local use of cold is mentioned by the majority of modern authors, yet that, practically, it has been ignored or rejected by them in favor of warm fomentations or poultices. That these latter often fail to give any marked or sufficient relief must be in the experience of all of us. That the use of cold instead of warmth, locally, will sometimes give marked relief, the following cases, which have all occurred to me within the last two years, will, I think, show.

**CASE 1.**—Mr. A—, suffering from enteritis of four days’ duration, apparently due to an excessive meal of white sprats. The symptoms were abdominal pain and commencing distension, frequent sickness, and high pulse and temperature. Ice in bladders was ordered to be applied to the abdomen as was found agreeable. Perfect rest of body was strongly enjoined, abstinence from much nutriment recommended, and the opium pills he was taking advised to be continued. He at once experienced relief; of his own accord reapplied the ice-bladders from time to time; in two days was greatly relieved; and from that time convalesced.

**CASE 2.**—Mrs. B—, suffering from severe and acute peritonitis of four days’ standing, attributed to cold. She had been freely leeches, with relief to the pain; but the abdomen was much distended, the sickness was urgent, she was thirsty and much flushed, the pulse was 130, and the temperature

102°. Here, again, the ice-bags were freely applied to the abdomen, whilst opium was continued at short intervals. She liked the effect of the cold so well that she voluntarily continued its use; and soon her symptoms began to improve, and she eventually got quite well.

**CASE 3.**—Miss C—, suffering from acute abdominal congestion due to obstruction of the bowels of many days’ standing. Here the abdominal distension was great, the sickness frequent, and the tenderness considerable. In addition to opium at intervals, ice-bags were now substituted for warm poultices, and the relief given by them was very decided. They were continued for many days at intervals, and under their use the sickness and the abdominal distension markedly subsided. The patient was ultimately relieved by operation; but there could be no doubt of the palliative efficacy of the cold.

**CASE 4.**—Mr. D—, suffering also from obstruction of the bowels. The symptoms were pain, sickness, constipation, and paroxysmal tortuous convulsions of the bowels. Ice was freely applied in the same manner as before, and the relief was marked and continuous. This patient eventually recovered from the obstruction, and the bowels acted again.

These cases are, I think, sufficient to show that, in the local use of cold in abdominal inflammation we have a remedy of great value in certain cases; and that though, of course, it is not applicable to all, and probably requires to be used tentatively in the great majority, yet that it is, when properly applied, both safe and reliable, and by no means to be regarded as precarious or as requiring “courage” for its application.

The forms of abdominal inflammation or congestion to which it is most suited are doubtless the more æsthenic ones, in their early or middle stages, before collapse begins to show itself, and where accompanying circumstances are not of a depressing nature. But it has seemed to me that the patient is generally the best judge of its suitability, and that it may safely be left to his or her feelings to decide as to the propriety of its continuance. In some cases the influence exerted is certainly most grateful to the feelings.

Niemeyer and others advise that the cold should be applied to the abdomen by means of cold water compresses or cloths wetted in iced water. The plan of applying the cold by means of one or two bladders half filled with broken ice, which can be shifted from place to place, has seemed to me to be more satisfactory. I have usually directed that they should be removed as soon as they cease to be agreeable, generally in twenty or thirty minutes, and reapplied after an interval of an hour or two. I wish to say that the first case in which I saw the cold so applied was one in which its local use was advised by Sir W. Gull, and from him I derived my knowledge of this mode of its application. The injection of iced water into the rectum has been suggested, but of this I have no experience.

The *modus operandi* is, no doubt, to abstract heat, to benumb exalted sensibility, and to contract the dilated and semi-paralysed vessels. And its especial effects have seemed to be, to diminish abdominal distension, to control the volubulous writhings of the bowels, and thereby to relieve both pain and tenderness. I can only add that very recent experience leads me to think that we have

of late unduly neglected a valuable therapeutical agent, and I have therefore ventured to bring the subject before the notice of our Society to-day.

ON THE

## ANTISEPTIC METHOD OF LIGATURE OF ARTERIES IN THEIR CONTINUITY WITH CATGUT.

By C. F. MAUNDER, F.R.C.S.,

Surgeon to the London Hospital.

I suppose it is natural for surgeons to be more impressed with the results of their own personal experience of any particular mode of treatment of disease than to be guided by the observation of others. At the same time those who occupy a public and unusually responsible position, and whose opportunities make them necessarily authorities, must not, in justice to the profession, ignore the doings of others. The subject before us is one of the highest importance. I have said elsewhere that "the fate or behavior of a given antiseptic catgut ligature, applied to the continuity of an artery, cannot be foretold"—I mean, applied on the antiseptic method. The above opinion was expressed in my Lettsomian Lectures early in 1875, and more recent information has, I think, confirmed that view. I find one surgeon of experience writing to the effect that the catgut ligature "becomes softened in a few hours, so as to lose its compressing power, and it is very soon thoroughly liquefied." Such was his experience in a particular instance, and he has consequently reverted to silk. Another surgeon, in response, says "this is certainly not always the case," and illustrates his remark by an instance of his own. Again, at a recent discussion at the Clinical Society, and other published experiences, circumstances both for and against the antiseptic method with catgut were mentioned, and many of them certainly tended to cast a doubt upon the safety of it. Personally I have had experience of a contradictory character, equivalent to that of the two surgeons alluded to—that is to say, in the one instance, the patient dying on the tenth day subsequent to the ligature of his brachial artery, the catgut had disappeared, but the internal coats of the vessel had been divided by it, and the channel was occluded by adhesion. In a second case, the patient dying on the sixth day, the ligature remained upon the vessel and firmly constricted it.

With regard to the division of the inner coats of the vessel by a ligature, that must depend both upon the degree of force and the size of the thread employed. If catgut be selected, my impression is that it should be used on the antiseptic method alone, lest, under other circumstances, failure of its expected effects and disastrous consequences, from quick solution, result. I may state that I have tied nine arteries antiseptically (five with catgut), and I believe with better results as regards early closure of the wound than would have occurred with silk. I shall therefore be justified in continuing to employ the antiseptic method with

catgut. At the same time I must not withhold the knowledge of the fact that in eighteen other instances in which I have tied arteries in continuity with silk, in no case has secondary hæmorrhage resulted—an accident which has been ascribed to the use of catgut, and is necessarily alarming.

Queen Anne-street, W.

## A Mirror

OF

## HOSPITAL PRACTICE

BRITISH AND FOREIGN.

Nulla autem est alia pro certo noscendi via, nisi quamplurimas et morborum et dissectionum historias, tum aliorum, tum proprias collectas habere, et inter se comparare.—MORGAGNI *De Sed. et Caus. Morb.*, lib. iv. Proœmium.

### MIDDLESEX HOSPITAL.

CASE OF CARIES OF THE TEMPORAL BONE; CEREBELLAR ABSCESS AND FACIAL PARALYSIS.

(Under the care of Dr. HENRY THOMPSON.)

THE significance of long-standing otorrhœa is too commonly underrated alike by the profession and the public. Purulent discharge from the ear is often allowed to continue year after year unchecked, and, sometimes, even encouraged as a lucky process of depuration. Cases like the subjoined—and they are by no means rare—show that otorrhœa is not only not so simple and harmless as some have imagined, but that, in addition to giving rise to permanent deafness, it may actually prove dangerous to life. It is no exaggeration to affirm that the life of a person suffering from chronic discharge from the ear is never safe. Fortunately, the diseases on which purulent discharge from the ear depend are, as a rule, very amenable to treatment, although many months may often elapse before a line can be pronounced complete. The remedies are safe and simple, but must be persevered in for months, and if need be, for years. Respecting the subjoined case we desire to call particular attention to the admirable description of symptoms and to the highly suggestive remarks made by Dr. Thompson on this interesting case.

P. S—, a baker, aged twenty-four, was admitted on the 6th July, 1875, when the following note was taken:—There is nothing of any moment in his family history, and nothing whatever that bears upon his present illness, except that a brother is said to have died at seven years of age from "inflammation of the brain." He himself twelve years ago had scarlet fever, and about four years ago gonorrhœa. His hair has been falling off for the last twelve months, but he denies ever having had a sore-throat or a rash upon the skin. He has had otorrhœa from childhood, and has often complained of severe pain extending from the ear downwards to the shoulder and upwards to the scalp, the pain being most intense over the temples on both sides. His present attack commenced three weeks ago, with headache, vomiting, giddi-

\* Surgery of the Arteries, 1875, p. 162.

ness, and shivering. He found himself unable to whistle; the room appeared to roll round; and he could not voluntarily close his right eyelids.

*State on admission.*—Face expressive of languor and distress; utterance thick; mouth distorted to the left on speaking. The powers of smell and taste are good, and vision is unimpaired. He is deaf, however, in the right ear, and cannot hear the ticking of a loud watch when placed upon the pinna. The tears escape from the right eye in abundance. There is pain in the temples and forehead; pain also, chiefly nocturnal, over the right mastoid process. An offensive discharge of pus and blood flows freely, with short intermissions, from the right ear. The right orbicularis palpebrarum acts imperfectly; at times, however, it just closes the eyelids, at other times it fails altogether, and leaves an interval of one or two lines between their margins. Its action is always strongest when the corresponding muscles of both eyes are called into play in unison. No cough; no heart murmur; no tenderness over the mastoid process; no apparent paralysis of the limbs. Pulse 68; respiration 20; temperature 98°.

July 7th.—The right eyeball moves outwards in a feeble and jerking manner, and the cornea scarcely reaches the external canthus at all.

10th.—Pain relieved. On attempting to raise the eyebrows the surface above on the left side is furrowed in the natural way, the right side is simply blank and smooth. A similar difference is seen in the vertical furrowing when he is desired to knit the brows. On showing the clenched teeth the left aperture of the mouth is widely and irregularly opened; the right remains closed, or nearly so. When he is told to shut the eyes by a forcible effort, the right lids just meet and no more, while the left are thrown into wrinkles and compressed strongly upon the eyeball. When the left eye is held open and he is requested to shut the right, he is wholly unable to do so, the unclosed interval measuring two or three lines. Even when the left eye is held shut by the finger and he is desired to close the right, the interval is quite distinct.

12th.—Pain across the forehead again severe; there is pain also over the entire dome of the cranium above the level of the ears.

14th.—Still in pain and extremely restless. The features are now more evenly balanced, and the naso-labial sulcus is less deeply cut on the left side. He closes the right eye when the left is held shut, even to the extent of corrugating the lids, and shows the teeth fairly well, with only slight distortion in the act. The right external rectus, however, is still wavering in its movements, and fails to bring the cornea home into the outer canthus.

15th.—Appears more drowsy than heretofore, and complains more of his head. Wandered about noon. Pulse 52, feeble and flagging. When he raises the eyebrows the left forehead is conspicuously wrinkled, the right in a lesser degree, but quite distinctly. He is, however, again unable to close the right eye when the left is held shut. In the evening a minute injection of morphia was administered, and he slept fairly during the night, though waking and wandering at times.

16th.—Morning: pulse 72; respiration 16; temperature 98.6°. Right pupil rather larger than left. There is now considerable distortion of the lips in the act of showing the teeth. The centre of the cornea remains fixed in the median line, and cannot

apparently be moved outwards. This observation, however, must pass for what it is worth. It is by no means certain whether the patient thoroughly understands the instructions given to him. He is at best but half conscious, although suffering at times from severe pain. In the evening he became drowsy and dull, and in the night he died after an attack of repeated convulsions.

It is unnecessary to dwell on the treatment, which was of no avail, for the most part, even in the way of palliation. Morphia injected beneath the skin in small quantities with extreme caution twice gave temporary relief. Once it failed altogether.

*Autopsy* (abridged from Dr. Coupland's report).—On removal of the calvaria, the vessels and sinuses of the dura mater were seen to contain fluid uncoagulated blood; the vessels of the pia mater were engorged, but there was no lymph on the surface of the brain; the inferior part of the temporo-sphenoidal lobe on the right side was superficially stained of a blackish-grey color where the lobe had been in contact with the petrous portion of the temporal bone; the substance of the cerebrum was soft and vascular; the right lateral lobe of the cerebellum was the seat of an abscess the size of a walnut, approaching to the surface near the anterior and superior aspects of the lobe, in close contiguity to the pons Varolii. The contents of the abscess consisted of creamy greenish pus of a highly fetid and gangrenous odor, the cavity being lined by a well-defined pyogenic membrane, and the surrounding nerve-substance dark-grey-colored. No other abscess was met with elsewhere within the brain. All the cranial nerves were examined at their origin, and appeared natural. The sixth and seventh nerves on the right side were particularly examined, with negative results. There was considerable adhesion of the dura mater to the cranium in the region of the right temporal bone, especially about the petrous part, and the separation of the membrane here revealed small collections of pus overlying extensive tracts of caries. The whole of the petrous bone was discolored, presenting a blackish-grey tint, and at the upper part of its root of origin from the squamous and mastoid bones there was actual absence of osseous tissue, a thin-walled pus-containing sac being here exposed. The right portio dura was carefully followed in its whole course from the internal auditory meatus throughout the aquæ ductus Fallopii; in its path over the superior wall of the tympanum it was bathed in pus, but the pus did not accompany it through the stylo-mastoid foramen. The chamber of the tympanum was filled with pus, and so were the cochlea and the entire labyrinth, which communicated freely with the abscess above described as existing at the root of the petrous bone. The membrana tympani was perforated, and the chain of ossicles, if present, were all hidden beneath the opaque semi-fluid contents of the tympanum. In the remaining organs nothing noteworthy was discovered beyond extreme engorgement of the lungs and kidneys.

*Remarks.*—The case above recorded, whether it deserves the name of Bell's paralysis or not, is at least an example of direct paralysis, owing to some lesion interfering with the competency of the facial nerve below the decussation, on its hither or peripheral aspect, the lesion and the paralysis being on the same side. Clearly the caries of the

temporal bone is to be regarded as the primary fountain-head of all the ensuing mischief; whether it is to be looked upon as the main proximate source and determining cause of the facial paralysis is another question, and one which there are good grounds for answering in the negative. If the abscess in the cerebellum had power to paralyse the outward movements of the eyeball by implication of the sixth nerve, as unquestionably it had, may we not ascribe the immediate origin of the facial palsy in the main, if not exclusively, to the same abscess, involving in the same way the portio dura of the seventh nerve, where the two nerve-cords run side by side over the surface of the pons within the distance of a fraction of an inch from each other, or where in the region of their nuclei the juxtaposition is still closer? There are many points in the case that lead to this conclusion. In the first place, there is the singular slightness of the paralysis. The distortion of the features was never extreme; even the palsy of the orbicularis palpebrarum, though beyond the proportions presented in ordinary hemiplegia, fell far short of the degree of intensity displayed in average cases of Bell's paralysis, and of course immeasurably short of the consummation of that malady in lagophthalmia. Now, *primâ facie*, there would be a fair presumption in favor of the idea that a nerve would be less liable to a damaging impression when softly cushioned on a bed of brain-substance than when cribbed and confined within a hard, unyielding envelope of bone, and there encompassed by dense or disorganised material constricting its substance, or otherwise impairing its energies. Here, however, there was no such material within the bony channel; the nerve was simply bathed in pus, and appeared in this situation to have had fair scope for the discharge of its duties. All, or nearly all, the morbid influences would seem to have been concentrated upon it within the cavity of the cranium, and there to have determined, for the reasons above given, a modified or abortive form of Bell's paralysis. Secondly, the oscillations in the degree of the facial paralysis, the pauses, the remissions, and the exacerbations so strangely contrasting with the steady advance of the disease as a whole, point strongly in the same direction. In particular, the symptoms of amelioration followed by those of relapse towards the close of the case would appear to be altogether inexplicable if they arose simply and solely from the condition of the temporal bone. They become at once intelligible when referred to changes in pressure or other collateral processes going on within the environment of the abscess. Lastly, there had been otorrhœa from childhood, and caries for an indefinite period prior to admission. Even the abscess was an old one, and the caries of necessity must have been older still, but the paralysis came on abruptly and concurrently with a violent outbreak of head symptoms only five weeks before death. Now sudden and dangerous explosions after a long stage of smouldering are quite in character with the behavior of abscess in the brain; they accord ill with the history of caries in the temporal bone, pure and simple, apart from abscess. The conclusion is clear: the paralysis must be taken along with the head symptoms in the reckoning, and credited to the same proximate cause—the abscess; however strange it may seem that the diseased bone played no immediate part, or next to none, in the determination of the palsy.

## GUY'S HOSPITAL.

ACUTE PNEUMONIA OF THE APEX OF THE RIGHT LUNG; PHYSICAL SIGNS SIMULATING EXCAVATION; RECOVERY.

(Under the care of Dr. WILKS.)

THERE is at present in Stephen ward a man convalescent from an acute affection of the right lung, that at one time so closely simulated excavation that it was impossible, from physical examination alone, to decide whether the patient was suffering from phthisis pulmonalis or not. The history of the commencement of the illness and its duration seemed to point to an affection of the lung partaking of the nature of acute pneumonia, and the result has justified the opinion expressed at the time by Dr. Wilks, that the disease from which the patient was suffering was pneumonical rather than phthisical, notwithstanding the strong testimony afforded by the physical signs that the man was really consumptive. Cases in which such a difficulty in diagnosis presents itself are not common, but they are by no means rare. Simple uncomplicated instances of acute pneumonia of the base occurring suddenly in persons previously quite healthy cannot, as a rule, present many difficulties; but when pneumonia commences less abruptly at the apex or affects this part as well as the base, in persons not previously very robust, absolute certainty of diagnosis is often for a time impossible. These facts should never be lost sight of in considering the serious question of the diagnosis of phthisis and the still more important one of prognosis. When the subject was raised three years ago, as to the contraction and cicatrization of pulmonary cavities, it may be remembered that many competent and trustworthy authorities expressed grave doubts as to the practicability in some instances of distinguishing with certainty between excavated and solidified lung. Some relied on one sign, some on another, but there was by no means an agreement as to the value to be assigned to any one sign or even set of signs.

The case that has given rise to these remarks is that of a fair-complexioned, thin, but muscular man aged thirty, who was admitted into Stephen ward on January 7th, looking pale, distressed, anxious, and evidently very ill. His breathing was short, rapid, and difficult, and he was troubled with a severe cough and copious expectoration. It was ascertained that he was married, of moderately temperate habits, and of good general health, for although he was a waterside laborer, exposed to all kinds of weather, he had never before been ill, except when a child he had a fever. His father is living, aged sixty-three and healthy, but his mother died of mammary cancer some years ago.

On January 8th the patient was seized with sudden shivering and pains in the limbs. Next morning he felt great pain in the right side, especially on coughing. The respirations were short and rapid, and he coughed and expectorated a great deal. It was not, however, until January 7th that he applied at the hospital, where he was at once admitted in the condition already described. On examining the chest dulness was detected over the right front to the mammary line. The breathing was bronchial, there was marked bronchophony, but no crepitation. Behind, on the right side, there was dulness extending down to the angle of the scapula; there were bronchial breath-

ing, bronchophony, and some fine crepitation on deep inspiration beneath the scapula. Temperature 108°; pulse 112; respiration 36. One ounce of brandy-and-egg mixture was given three times a day, and milk diet was ordered.

On Jan. 9th the morning temperature was 104°; pulse 120, small and wiry; respiration 38, quick and shallow. The physical signs were unaltered, and there was no pain in the chest; the tongue was furred in the centre, but moist; the cheeks were flushed, and the skin hot and dry; heart sounds healthy; there was great thirst, and much expectoration, which was rusty and tenacious; urine acid, chlorides diminished, sp. gr. 1018, and containing a slight trace of albumen. —Evening temperature 104°; pulse 120; respiration 44.

On Jan. 10th there was complete dullness of right chest, back and front, tactile vibration was diminished, and the breathing bronchial. Temperature 108°; pulse 112; respiration 40.

On the morning of Jan. 11th the temperature was 102°; respiration 108. The brandy-and-egg mixture was ordered to be given every four hours, and ten grains of compound ipecacuanha powder at night. Beef-tea ordered.

On Jan. 17th the patient was much better; the dullness had diminished. There was loud, harsh respiratory murmur all over right chest, and some moist râles at the base on the same side.

From this time the patient rapidly improved, the temperature soon became normal, the dullness gradually subsided, and all the physical signs resumed a natural character. He gradually regained strength, and declared on Monday last that he felt quite well.

### WEST LONDON HOSPITAL.

STRICTURE OF THE URETHRA AND SCROTAL FISTULA OF SIX YEARS' DURATION; INTERNAL URETHROTOMY; CLOSURE OF FISTULA FOUR DAYS AFTER OPERATION.

(Under the care of Mr. TEEVAN.)

CHARLES T—, a baker, aged thirty-three, was admitted into the hospital on Jan. 12th, 1876, having been placed under Mr. Teevan's care by Mr. Scott of Kensington. The patient, who was in bad health, stated that he had a gonorrhœa fifteen years ago, for which he was treated by medicines and injections. The complaint degenerated into a gleet, and hung about him for a long time. About thirteen years ago he began to experience difficulty in urinating; and a year later he suffered from typhus fever, during which he was attacked with retention. No catheter could be passed, but relief was afforded by the bursting of an abscess, which opened in the centre of the raphe of the scrotum. From that period he micturated through the fistula that remained, a few drops only of urine escaping through the meatus externus.

On examination, the entrance to the stricture was found to be four inches down the urethra. No metal or elastic catheter could be passed, as nothing but a fine bougie could be insinuated through the stricture. The contracted portion of the canal was about an inch long, and to the fingers felt as if it contained a metal catheter. The

part of the scrotum where the fistula was situated was invaginated, indurated, and firmly bound down to the corpus spongiosum. The orifice of the fistula was not easily detected, as it was placed at the bottom of the cul-de-sac.

On Jan. 18th, at 3 P.M., Mr. Teevan introduced a fine bougie into the bladder, and, having screwed a slender catheter staff on to it, passed it on, and demonstrated its entry into the bladder by withdrawing some urine. A sheathed knife was then slid down to the stricture, which was divided from before backwards. About one tablespoonful of blood was lost. A large metal catheter was then introduced, and, having drawn off all the urine, immediately withdrawn.

On Jan. 19th, at 10 A.M., Mr. Alderton, the house-surgeon, found the temperature 98°; and pulse 72; at 4 P.M. the patient had a rigor. After that he rapidly recovered, and on the 22nd urine ceased to escape from the fistula. On that day Mr. Teevan introduced a large metal bougie, and again on the 25th and Feb. 2nd, on which day the patient left the hospital in all respects well. Since then he has learned to pass a full-sized elastic catheter with ease for himself.

Mr. Teevan observed that an operation was indicated on account of the chronic and indurated character of the stricture and fistula. The result proved the truth of the now prevailing belief that fistulæ will usually close of their own accord if the contracted portion of the urethra be restored to its normal calibre. The closure of the fistula, after six years' patency, was effected in the very brief space of four days, which was an unusually short period, even in favorable cases, and simply showed what brilliant results could be achieved by the operation of internal urethrotomy. There was one point to which he would wish to draw special attention, and that was, that no catheter was left in the bladder after the operation. In this country and in France no surgical practice had been more dogmatically insisted on than the necessity of the retention of a catheter after urethrotomy, and eminent British surgeons had pointed out the "disastrous" effects that would ensue if the catheter were not retained. Dr. Gourley, of New York, had, however, clinically demonstrated that the retention of the instrument was not only useless, but prejudicial, and the present case showed that there was not the slightest necessity for the surgeon to annoy the most sensitive canal in the body by obliging it to hold a catheter for twenty-four hours or more.

### LIVERPOOL ROYAL INFIRMARY.

IMPERFORATE ANUS IN A CHILD THIRTY-THREE DAYS OLD; OPERATION; RECOVERY.

(Under the care of Mr. REGINALD HARRISON.)

On Tuesday, the 8th inst., Mr. Harrison operated on a child for imperforate anus under the following unusual circumstances:—The patient was a well-nourished female child, aged three days, and was born with an imperforate anus. For this, shortly after birth, a puncture had been made by the patient's medical attendant in the position of the anus, but without any effect. The child had been fed upon the breast, and, with the exception



of vomiting occasionally, appeared to suffer no inconvenience. Within the last few days the vomiting had been incessant, and of a fæcal character.

The child, when placed on the operating-table, presented a remarkable appearance, the abdomen being enormously distended, and covered with veins. In miniature, it represented the appearance of a woman suffering from a large ovarian tumour. The genital organs were naturally developed. There was a complete absence of anything like an anus; nor was there any indication to guide to the position of the bowel.

Mr. Harrison operated in the following manner:—An incision was made through the skin at a point corresponding to the anus, and the knife was cautiously pushed upwards in the direction of the rectum for an inch and a half. The incision was made free enough to admit the little finger, which was then introduced to the bottom of the wound, when the pressure of bowel was indistinctly felt. The largest trocar of the aspirator was then introduced, when a gush of fæcal matter took place. Into the puncture made by the trocar an ordinary pair of dressing forceps was passed, by means of which the opening in the bowel was considerably enlarged. A large escape of fæces now took place; no pressure was exercised on the abdomen, as it was thought better to let the distended intestines empty themselves gradually. A piece of oiled lint was introduced through the wound into the bowel. During the remainder of the day the child passed a quantity of fæcal matter.

On the following day (Feb. 9th) the child appeared in no way to suffer from the operation. It had slept and taken the breast naturally. There had been no vomiting. Several motions had been passed.

Feb. 10th.—The improvement continues. Bowels acting naturally.

11th.—There does not appear to be anything wrong with the child: motions are passed at short intervals, the abdomen is almost the natural size, and the child is thriving. The mother and child returned home.

In alluding to this case Mr. Harrison said that he regarded it as one where the lower portion of the rectum was completely absent. By keeping the incision in the direction of the bowel he believed that he had affected an entrance into the intestinal canal at its lowest portion—viz., the upper part or the rectum. Considering the distended condition of the bowels, he did not think there would be any difficulty in maintaining the patency of the opening that had been made. That the child should have suffered so little inconvenience from this prolonged imperforation was a very remarkable feature in the case, and rendered, so far as he was aware, the case unique.

The child's condition on leaving the infirmary was such as to make the prognosis favorable.

## BIRMINGHAM AND MIDLAND HOSPITAL FOR WOMEN.

CASE OF HÆMATOKOLPOS; OPERATION; RECOVERY.

(Under the care of Mr. LAWSON TAIT.)

E. T—, aged eighteen, had menstruated regularly for two years, but the discharge was very scanty and accompanied by agonising pain. She

had applied at various institutions without obtaining relief.

Vaginal examination, made under ether, revealed a mass occupying the pelvis, in the position and about the size of the uterus pregnant as far as the third month. No cervix could be made out, but at one point, close to the rectum, there was a small circular patch about the size of a shilling, where there was pseudo-fluctuation, and the feeling was as if a membrane were stretched tightly over the mouth of an elastic bottle.

Believing this to be the cervix uteri, Mr. Tait freely incised it, and thereby evacuated a large quantity of the usual treacly fluid which represents retained menstrual blood.

The patient recovered rapidly, and the wound has remained patent, so that she now menstruates without the slightest pain.

The only puzzling element in this case was the history, for it is beyond doubt that every month a menstrual discharge took place, and if great weight had been attached to this the diagnosis would have been greatly complicated.

As the patient was perfectly virginal, it cannot be supposed that the closure of the os was due to injury.

HYDATID TUMOUR OF KIDNEY; TAPPING FOLLOWED BY COMPLETE CURE.

(Under the care of Mr. LAWSON TAIT.)

S. G—, aged thirty-five, had noticed a tumour growing on right side for thirteen weeks. It was (May 12th, 1874) about the size of a cocoa-nut, situated in the position of the right kidney, very movable in an up or down direction, but very slightly towards either side, distinctly multicystic, and painless, and there was a line of intestinal resonance between it and the liver. It was diagnosed as a cystic tumour of the kidney, probably of an hydatid character.

The patient was under notice for a year, during which time the tumour underwent no change. But on the 14th of May, 1875, it was found to have greatly increased in size, and to be somewhat painful. On the 24th it had reached the size of an adult head, and was very tender to the touch, and the patient's urine, which had been up to that time perfectly normal, was slightly albuminous. The tenderness diminished somewhat till the middle of June, when she was seized with a violent spasmodic pain, running down in the direction of the bladder, and she was voiding at short intervals small quantities of ropy, purulent, and very offensive urine. It became evident that the cyst had ruptured into the ureter, and it seemed improbable, from the nature of what was coming away, that the natural effort at cure would be, unaided, sufficient. Mr. Tait therefore punctured the cyst with a large aspirator needle, and removed three quarts of the same fluid which was passing by the ureter. It was found to contain numerous echinococci.

The kidney colic ceased immediately, the cyst never refilled, nor have any pus or echinococci been since found in the urine; and the patient was, in December last, perfectly well and free from every trace of the tumour.

## Editorial.

### THE CAUSE OF THE COAGULATION OF THE BLOOD.

THE experiments of Mr. Lister effectually disposed of all theories which ascribed the coagulation of the blood to the escape of a gas. He showed that blood might be poured through the air several times, so as to afford the freest opportunity for the escape of any gas, and yet remain uncoagulated for hours, provided it were kept in vessels formed of natural membranes. M. Glénard, in some experiments published last summer, corroborated very fully Lister's results; and asserted, in further disproof of any influence of gases on the coagulation, that blood enclosed in excised vessels might be plunged into any gas, including carbonic acid, without coagulation occurring. MM. Mathieu and Urbain, who a year ago advocated the opinion that the presence of carbonic acid was the immediate cause of the coagulation, have recently communicated to the Académie des Sciences some experiments in support of their preceding observation, and in opposition to Glénard's results. They urge that the influence of the normal vascular wall is relative and not absolute, and that it is less than M. Glénard supposes. It may be remarked that Lister, at any rate, maintains that the influence of the normal wall of a vessel is absolute in preventing coagulation; but that it is impossible to keep any part of a vessel in a perfectly healthy natural state under the conditions of an experiment; and that, in proportion to the change thus occasioned, the effect of the vessel is relative and not absolute. MM. Mathieu and Urbain go on to point out that coagulation may occur in the ligatured vessel of a living animal. They advocate, further, the influence of the presence of carbonic acid in causing coagulation, on the ground—first, that the coagulation occurs when the escape of carbonic acid is hindered by immersing portions of bloodvessels full of blood in a quantity of oil, or by placing them in an atmosphere of carbonic acid. Secondly, they repeat that a current of carbonic-acid gas, passed through uncoagulated blood, determines the immediate formation of fibrinous clots, little colored, similar to those obtained by whipping the blood; while, on the other hand, a current of air of hydrogen or of carbonic oxide, leaves it fluid. They affirm that if the carotid artery or jugular vein of a dog, filled with blood, be suspended in a vessel of carbonic-acid gas, coagulation will take place in three-quarters of an hour. They found that the vein of an ass, treated in a similar way, presented coagulation of the blood within it after two hours' immersion; while the

blood, in a similar segment suspended in the air, was still fluid after the same time. Beneath oil, the coagulation was complete in three hours. Tubes composed of the intestines of birds yielded similar results. These conclusions are very different from those of M. Glénard, who found that, under identical circumstances, the blood was uncoagulated even after twenty hours. MM. Mathieu and Urbain admit, however, the occasional slowness of the coagulation of blood enclosed within an animal membrane and exposed to the action of an atmosphere of carbonic-acid gas. The only explanation for this which they can offer is, that carbonic-acid gas passes through the organic membrane of a vessel containing fluid less readily from without inwards than from within outwards; and, further, that the blood possesses the power of absorbing a considerable quantity of this gas. In proof of the former assertion, they took two identical bladders composed of organic membrane; one containing distilled water from which all gas had been removed, the other containing the same volume of water saturated with carbonic acid. The former was placed in an atmosphere of carbonic acid; the latter left exposed to the air. After half an hour the quantity of carbonic acid contained in each bladder was determined; and it was found that five cubic centimetres of carbonic acid had passed into the one, and fifteen cubic centimetres had passed out of the other. This assumes that the constant transudation of water through the wall of the bladder containing it so hinders the entrance of carbonic acid as to account for much of the difference in the two cases. In proof of the absorptive power of blood for carbonic-acid gas, they found that 100 cubic centimetres of defibrinated blood absorbed 220 cubic centimetres of carbonic-acid gas; while 100 cubic centimetres of serum absorbed 180 of carbonic-acid gas. Thus the blood-corpuscles seem, in 100 cubic centimetres of blood, able to hold more than 90 cubic centimetres of carbonic acid. Previous researches had, however, shown them that it was only the carbonic acid contained in the plasma which effected the coagulation; and hence another element in the retardation of the coagulation, since it cannot occur in blood exposed to carbonic acid until the affinity of the corpuscles for the gas is satisfied.

M. Glénard, in a reply communicated a short time ago to the Académie by M. Bernard, reasserts his former position, that the influence of the vessels in preventing coagulation is paramount and irrespective of any relation to carbonic acid. Blood may be dried slowly in an isolated vessel without coagulation, and afterwards rendered fluid by moisture, still without coagulation. He further suspended by one end the segment of a vessel containing blood. The corpuscles soon sank to the bottom, leaving a colorless supernatant plasma.

He opened the lower end, and allowed the lower portion, containing the corpuscles, to escape. He then replaced the corpuscles thus removed by pure carbonic acid. The plasma was thus brought into immediate contact with a large excess of carbonic acid; and there could be no question of absorption by the corpuscles or osmosis through a membrane. The two were thoroughly mixed, but not a trace of coagulum formed in the vessel.

This experiment appears to us, as it did to M. Chevreul, conclusive. It disposes effectually of the theory that the coagulation of the blood has any relation to the presence of carbonic acid. The experiments of MM. Mathieu and Urbain still remain to be explained, and are certainly worthy of careful repetition. We would suggest that some of their results may be explained by the influence on the wall of the vessel of the carbonic-acid gas or of the oil in which it was suspended. The outer wall of a vessel exposed to an atmosphere of the gas may undergo changes which, extending to its inner wall, render the latter capable of determining the coagulation of the blood. In the experiment of M. Glénard this may not have taken place, because the gas, well mixed with liquid, came in contact with the inner surface, to which the mixture would be less foreign. It is with satisfaction that we find the experiments and conclusions of our own countryman thus fully corroborated, and we would only remark that the observations of Lister seem to have received less attention from the French experimenters than they deserve.

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### BACTERIA.

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Two memoirs have just appeared from the pen of Dr. Ferdinand's Cohn, in his *Beiträge zur Biologie der Pflanzen*, which possess much interest: the first dealing with the classification of Bacteria, and the differential characters of these minute organisms, as we must still continue to call them, though the term is scarcely appropriate, so little structure do they present; whilst the second is chiefly occupied with the development of Volvox. In the former, he points out the difficulties of defining species in such minute bodies as bacteria, which present so few points of difference under the microscope; and criticises Billroth's division of them into micro- meso- and mega-coccus, and micro-meso- and mega-bacteria,—the former including the round, the latter the rod-shaped bodies, and both of which Billroth believed were only different forms of one species, to which he gave the name of *Coccobacteria septica*. Cohn seems rather disposed to maintain that bacteria of different forms and of different fermentative activity should be re-

garded as distinct species till evidence is obtained to the contrary. He quotes Billroth's description of *Ascococcus*, and shows that he has described two forms under that name. In his efforts to obtain evidence of the germs of bacteria in ordinary atmospheric air, Cohn satisfied himself that Pasteur's method of filtering the air through cotton-wool, and then dissolving the wool, was as un-serviceable as Pouchet's aeroscope, which consists of a slide smeared with glycerine; and adopted, instead, the plan of transmitting a small quantity of air through a solution capable of supporting and promoting the life and multiplication of bacteria (namely, a 1 per cent. solution of tartrate of ammonia, with other salts in due proportion). After the transit of air for some time, this fluid becomes turbid; flocculi of mycelium appear, which rapidly increase in size, and are soon easily recognisable, even by the naked eye, by the color of their conidia. *Aspergillus* and *penicillium* are amongst the most commonly developed forms, whilst *mucor* only appeared once. The proportion of germinating plants to the air in these experiments was such that one active spore existed in each ten litres (or about seventeen pints and a half) of air. According to this, a healthy man introduces about 1000 active spores of fungus into his lungs per diem, the majority of which must either be discharged again or have their growth arrested, otherwise the bronchial tubes would soon become choked. The troubling of the fluids in the wash-bottles was in great measure also due to the presence of yeast-cells. But, curiously enough, bacteria did not, as a rule, make their appearance. This Cohn attributes, not to an absence of the germs of bacteria in the air, but to the circumstance that, being extremely light and surrounded by a gelatinous envelope, they are not easily retained by water, but are set free again as each bubble that has passed through the water bursts. Cohn thinks that spores can only germinate when they have been thoroughly moistened; and this accords with Burdon-Sanderson's statement that the infection of bodies in a state of putrefaction is effected, not through the agency of the air, but of water. Cohn describes with great minuteness the characters of a peculiar organism to which he has applied the term "*ascococcus Billrothii*," which possesses some remarkable properties. It consists of extremely minute spherical bacteria, associated together in large numbers to form lobed masses, which are surrounded by a gelatinous, or rather cartilaginous (for it is too tough to break up by compression) envelope. These increase and multiply, and gradually form a creamy scum, possessing a remarkable odor resembling butyric acid. Coincidentally with this, the acid reaction of the fluid containing the acid tartrate of ammonia becomes intensely alkaline, and ammonia is liberated. He also describes the characters of various-colored microscopic or-

ganisms—chlorococcaceæ—which make their appearance in different animal and vegetable infusions, and one of which—*Bacterium rubescens*—is fully discussed by Mr. E. Ray Lankester in the *Quarterly Journal of Microscopical Science* (Jan. 1876). Cohn enters also into some details in regard to the genus *Beggiatoa*, which forms long, thin, and colorless mucous fibres that cover all the rocky bottoms of the Georgian lakes, and which seems to have the power of living in water impregnated with sulphuretted hydrogen, and of decomposing that gas. Cohn proposes the name of “schizophytæ” for the whole group, which he divides into “gloegenæ” and “nematogenæ.” The former he subdivides into (a) those having free cells, or cells divided binarily or quaternarily; (b) those having cells inserted into amorphous families of mucus; (c) those having their cells inserted into well-defined families of mucus. The latter (nematogenæ) he subdivides into those in which the cell-filaments are unbranched, and those with fibres with false branches.

#### THE SPREAD OF WHOOPING-COUGH.

THERE is no more difficult problem in practical epidemiology than that presented by some of the milder epidemic diseases. With a malady which, like cholera or typhus, strikes down the affected in definite seizure and retains him in unrelaxing grasp for a considerable part of the period during which the disease is communicable to others, the task of isolation is rendered comparatively easy, and the work necessary to arrest the spread of the disease is distinct and obvious. But with those affections which interfere less with the ordinary course of life the case is far otherwise. The difficulty of isolation, when the existence of the disease is known, is vastly increased; the problem is also rendered more complex by the frequent obscurity of the symptoms which mark the invasion and the course of the affection. Moreover, some of these diseases are in their common and immediate aspect so trifling that the sanitary reformer is baffled in his efforts by the indifference of those whose practical co-operation is all-essential to success. Whooping-cough is a disease to which these remarks apply very pointedly. A malady to which a large number of deaths is indirectly due, which often prepares the way for some of the gravest affections to which childhood is liable, whooping-cough, nevertheless, rarely kills directly, and does not, in its ordinary intensity, interfere much with the patient's usual habits. Confinement to bed is rarely necessary, but, without it, effective isolation is most difficult. Confinement to the house is, in a large number of cases, not urgently indicated by

any symptoms, and parents among the poor are only too glad to avoid, if they can, irksome and tiresome restraint. During even the most contagious period of the malady the distinctive symptoms may be so obscure that its existence may be unsuspected by the best informed and by the most observant. A medical officer of health communicates to us a pertinent illustration. He had been so impressed by the insidious spread and disastrous effects of whooping-cough that, during a recent outbreak, he issued a circular to the various schoolmasters and schoolmistresses requesting them to have all children suffering, or suspected to suffer, put upon the sick-list and isolated. At the very time, one of this gentleman's own children was suffering from whooping-cough, unsuspected even by his father, and was running about at large. He had contracted it at school, and it was only when his brothers and sisters contracted it from him that the existence of his affection was recognised. Moreover, as our correspondent points out, when whooping-cough is epidemic, hardly any public conveyance can be entered without the distinctive whoop saluting an attentive ear.

It seems a nearly hopeless task to attempt to exterminate or even materially to lessen a disease the form of which may be so insidious and the extension of which is so easy. It is obvious that the only means at present available is the limitation of contact between the sick and the healthy. That the disease is largely spread by school-contact is unquestionable. It is probable that more might be done to lessen the facilities for the extension of epidemics which schools afford. Better provision should be made for the isolated instruction of those children who have been exposed to contagion. Those suspected of the disease should certainly be excluded altogether from attendance. Information should be given to the school authorities, under strict compulsion, of the outbreak of any contagious disease in the homes of the children in attendance; and, further, the school teachers should be well trained in the essentials of practical epidemiology. They should be instructed how to recognise symptoms of suspicious character, when to enforce isolation, and how to manage disinfection.

How far other measures for the arrest of these milder epidemics are practicable, measures of more effective isolation, is a very difficult question. There is so much about these diseases of which we are yet ignorant. The “whoop” may probably persist, for instance, long after the disease is communicable to others. It would be unreasonable to require that a man who whoops should desist from his normal occupation, from earning his bread and cheese it may be, at any rate until we can say definitely whether he is or is not likely to spread the disease. The clear indication is for more systematic and scientific study of the conditions of

the origin and spread of these diseases, which cannot but throw important light on the question of their arrest. It is a matter of congratulation that much modern work is taking so definite a direction towards this end. The scientific grants of Government and of our Societies cannot be devoted to a more directly practical object, or to one of greater social importance.

### ENDEMIC DISEASES OF MARSHY DISTRICTS.

AN important contribution on the subject of the Pathological Anatomy of the Endemic Diseases of Marshy Districts, by Dr. A. Kelsch, is contained in a late part of Brown-Séquard's *Archives de Physiologie*. Dr. Kelsch appears to have had large opportunities of studying these affections; since he admitted, in the course of a single year, no less than 1181 patients suffering from acute or chronic fevers of paludal origin, and devoted himself to an investigation of the changes occurring in the blood and in the principal tissues and organs. On examination of the blood in simple fevers he found that, whether the marsh miasm proves rapidly or slowly fatal, profound alterations are perceptible in the blood, though there may be no marked changes in the physical characters of the tissues. These alterations consist in an absolute diminution in the number of the corpuscles, in an augmentation in the volume of the red corpuscles, and in the development of black pigment which is not normally present in the blood. In regard to the first point, Dr. Kelsch shows from daily enumerations, commenced at the period of the first attack of the fevers, that the diminution in the number of the corpuscles, or "oligocythæmia," is very rapid and considerable in all the forms of marsh fever. Thus in one case the number of corpuscles, which amounted at first to 4,892,500, was, in the course of twenty days, reduced to 1,480,898 in the cubic millimeter. The reduction in the number was excessively rapid during the initial period of the fever, when the febrile symptoms were more or less continuous or remittent, the patient losing no less than 2,000,000 corpuscles per cubic millimeter during the first four days. A second period succeeds, corresponding to the quotidian or tertian type assumed by the fever, during which the loss, though continuous, is slower; and this is followed by a third period, characterised by quotidian type of the fever with intervals of apyrexia, in which the number of the corpuscles, though reduced to a very low figure, yet fluctuates. In one case the number of corpuscles fell to 583,000 red corpuscles in the cubic millimeter, which is about one-tenth of the ordinary amount. The fever had, however, in this in-

stance lasted with intervals for a year, and the patient had suffered from previous attacks during the epidemic season. The white corpuscles appear to undergo still greater proportionate diminution than the red, notwithstanding the augmentation in the volume of the spleen.

Careful observation of the corpuscles themselves, suspended in artificial serum, showed that they underwent considerable alteration in size, three varieties of form being present. These were, first, large pale corpuscles; secondly, smaller, strongly tinted, crenated corpuscles; and, thirdly, smooth, highly colored, and highly refractile corpuscles. Of these forms, the first became more abundant as the oligocythæmia became more strongly marked—sometimes, in fact, constituting the whole mass of the corpuscles. As the blood regenerated itself in the progress of recovery, they appeared to be replaced by the other two forms. There was then, in addition to the oligocythæmia, distinctly marked macrocythæmia.

In the most pernicious forms of marsh fever, Dr. Kelsch observed extraordinary rapidity in the diminution of the red corpuscles, the blood losing in forty hours 1,282,160 red corpuscles per cubic millimetre; prompt regeneration of the blood at the termination of the pernicious attack; and, lastly, an increase, both relative and absolute, in the number of the white corpuscles, the proportion of white to red rising steadily from 1:500 to 1:70.

Lastly, Dr. Kelsch insists on the importance and the frequency of the impregnation of the blood with black pigment or melanæmia occurs in marsh fever of the pernicious form, in cachexia, and even in simple fevers. It is met with in the blood traversing the vessels as well as incorporated with the tissue of the spleen, of the medulla of the bones, and of the liver, but is occasionally absent. The pigment is most abundant in the blood of the *venæ portæ* and *splenicæ*, whilst it is much less in quantity in the blood of the venules of the jugular. The pigment appears in the form of small granules, black in color and rounded in form, surrounded by protoplasm. It is not improbable that the pigment proceeds from the disintegration of the red corpuscles.

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UNDER the heading of "The Impending Danger," a writer in the *New York Medical Record* publishes a somewhat sensational article on the consumption of opium in the United States. "America is in peril of becoming a nation of opium inebriates. Tens of thousands of hapless devotees bow at the shrine of this seductive goddess, and from the palace and the poorhouse, the hall and the hovel, is being recruited the increasing host marching downwards with steps slow but sure to death or degradation." The writer appears to think that much of the evil is directly attributable to the frequency with which opiates are prescribed by American physicians; while, the morbid craving having been once established, there is no limit to the amount of the drug which the victims may obtain from dispensing chemists. The natural suggestion, of course, is that the sale of opium should be restricted.

## Medical Annotations.

"Ne quid nimis."

### THE INTERNATIONAL WALKING MATCH.

THE advent of this famous American walker cannot be without interest to the medical profession, seeing that he may be considered as one of the instruments which has served to correct our notions as to the relation of the excretion of nitrogen to work. It was in 1870 that Dr. Anstin Flint, jun., undertook the estimation of urea eliminated by Weston during a great walking feat, and the result was that the urea excreted, instead of being in excess, was, if anything, below the normal amount. When Flint's first experiment was made Weston walked 100 miles in twenty-two consecutive hours, as he did recently in the Agricultural Hall. During the time he consumed a highly nitrogenous diet, and the  $7\frac{1}{2}$  ounces of urine excreted were found to contain  $424\frac{1}{2}$  grains of urea, at least 50 grains less than the amount which a man of his height and weight might be expected to eliminate during a like period without any abnormal exercise. It is true that Dr. Flint argued that the urea excreted by Weston was greatly in excess of his normal amount, but the majority of the profession would take a different view, and this and subsequent experiments tend to show that the nitrogen excreted was mainly due to the nitrogenous ingesta, and that Dr. Parkes is right when he asserts that "*during exercise the system appropriates more nitrogen than it gives off.*"

Weston commenced walking on Tuesday night at 9.25, his effort being made partly against time and partly against a competitor—one Perkins, an English pedestrian of some note. Weston undertook to walk 115 miles in twenty-four consecutive hours, and also to walk a greater distance in the time than his opponent. Perkins only accomplished sixty-five miles, and then had to give up, owing to the condition of his feet, which were terribly galled and bruised. This was owing to his walking in thin shoes upon bare boards. Weston continued to walk with unprecedented pluck and endurance, and it was not till he had accomplished seventy-eight miles that he took any real rest, and then for only twenty-five minutes. He failed to complete his 115 miles in the time specified, but managed to accomplish more than 109 miles, or more than  $4\frac{1}{2}$  miles an hour for twenty-four consecutive hours. This certainly is a most extraordinary feat, and one which a few years since would have been deemed impossible. We saw Mr. Weston walk his last six miles, and although obviously exhausted, and a trifle lame, he was walking with admirable pluck, and at a pace which appeared to us to be about  $8\frac{1}{2}$  miles an hour. His style of walking is very peculiar and most inelegant. His costume consisted of a shirt, velvet knee-breeches, and high, tolerably heavy "butcher" boots. He walks almost entirely from the hips, moving the knees, ankles, and feet comparatively little, and swinging his arms; carrying a light switch in his left hand, and occasionally eating as he went, he "stumped" round and round his course most doggedly. Mr. Weston is thirty-six

years of age, tall and well made, though somewhat slender. He is very abstemious in his habits, and dines generally off cold meat. We were admitted to Mr. Weston's private room about a quarter of an hour after he reached his lodgings. He was then reclining on the sofa, having his feet bathed in warm salt water. The feet and legs were marvellously free from swelling. There was a blister on the right toe, and on the sole of the right foot, containing bloody serum. He looked pale and somewhat shocked. He had vomited a considerable quantity of what appeared to be altered blood. His pulse was 96, and his temperature  $97.50^{\circ}$ . He soon vomited again. His pulse after this got slower, and came down to 78; it was free from irregularity and intermission, and the heart-sounds were natural and clear. His breathing was quiet. He was much mortified at not accomplishing the full distance, but he may feel assured that the English people will give him great credit for doing what he did. Weston complained very much of the smell of tobacco and of fuses in the hall, saying it always made him feel ill and giddy. These sensations were so bad at the beginning that he felt as if he would have to stop. They induced him to depart slightly from his general rule of taking nothing but beef-tea, tea, farina, &c., on his walk, and to take once or twice a small quantity of brandy-and-water, and towards the last a little champagne. With great admiration for the determination and endurance shown by Mr. Weston we must still ask whether such a strain on the muscular, nervous, and vascular systems is justifiable.

### THE AMYLOID DEGENERATION OF TISSUES STUDIED WITH THE AID OF NEW COLORING AGENTS.

In a memoir devoted to the subject of amyloid degeneration of the kidney, liver, and spleen, which appears in a recent part of the *Archives de Physiologie*, M. Cornil, of La Charité, gives the results of his experiments with several new coloring matters. Two of these were methyl-anilin violets discovered by M. Lauth, the third was a violet discovered by M. Hoffmann, of Berlin. The preparations can be stained with these violets either when fresh or after being hardened in spirit (Müller's fluid or picric acid); and the coloring agents have this peculiarity, that certain tissues, as cartilage, decompose them into a violet-red and a blue-violet, each of which becomes fixed in different elements of the tissue; the hyaline matrix, for example, assuming a red color, whilst the nuclei and cellules, as well as the cartilaginous capsules, become of a blue-violet tint. The normal tissues of the liver, kidney, and spleen, however, do not decompose the violets, but when amyloid degeneration is present, the degenerated and semi-transparent parts resembling colloid become of a violet-red, whilst the normal elements are tinted of a violet-blue, and thus a means equal, if not superior, to that of iodine, is afforded by which the changes may be followed.

The examination of kidneys slightly affected with amyloid degeneration demonstrated that this was limited to some of the vascular loops of the glomeruli, which alone became tinted of a violet-red color, the remainder of the preparation, including the bloodvessels and connective tissue, presenting a blue-violet tint. This condition M.

Cornil some time ago showed was coincident with parenchymatous nephritis and advanced granular and fatty degeneration of the renal epithelium. When the amyloid degeneration is more advanced, the glomeruli become almost completely reddened, and the same tint is observed in the arterioles of the kidney and the larger renal arteries, the walls of which are in addition greatly thickened. In like manner the hyaline membranes of the tubuli uriniferi, both in their contorted part and where they form the loops of Henle, are thickened and degenerated. Neither the endothelial cells of the vessels nor of the tubes, nor the connective-tissue corpuscles, undergo any degenerative change, which is in opposition to the views which are generally accepted.

Careful examination of the liver in a state of amyloid degeneration also showed that the hepatic cells were unaffected, though M. Cornil desires not to lay too much stress upon this, since it is in opposition to generally received opinion, and even to his own antecedent investigations; but in all the instances he examined, the walls of the capillaries or of the hepatic arteries and veins were thickened and had undergone amyloid degeneration.

Amyloid degeneration of the spleen exhibited itself in two forms; in the first the lesion was limited to the corpuscles of Malpighi, whilst in the second it was diffused and specially affected the splenic pulp. In both instances the metamorphosed parts were rendered very distinct by the use of the methyl-anilin violeta.

#### HOW TYPHOID FEVER IS SPREAD.

DR. FRANKLAND, in a recent address to the Fellows of the Chemical Society on the Organic Impurities of Drinking-water, adduced, as a striking instance of the persistency of the typhoid poison when diffused in water, the outbreak of a violent epidemic of typhoid fever in a Swiss village through the use of spring water which, after contamination with the poison, had filtered through nearly a mile of porous earth, but had nevertheless lost none of its virulent properties. The occurrence in question is one of the most remarkable, if not the most remarkable, on record, and the circumstances in connexion with it have been exhaustively investigated by Dr. A. Hägler, of Basel. The facts have been set forth by the late Professor Parkes in the last volume of the Army Medical Bluebook, and briefly by Professor Frankland in a communication to *Nature*.

In the village of Lausen (on the railway from Basel to Olter) epidemic enteric fever had never occurred in the memory of man, and the neighborhood was also free. The ground consists of marl and lime, and is tolerably water-holding. Certain well-water was only used by the inhabitants of six houses, while the other inhabitants (780, in 90 houses) used the water from a public spring which arises at the foot of a hill, the "Stockholden." This water is received into a reservoir, and then led, by wooden pipes, into four stone tanks. On 7th August, 1871, ten inhabitants were attacked, and, in nine days more, fifty-seven persons were sick with typhoid fever. These cases spread over the whole village using the spring water, but the inhabitants of all the houses which had wells of their own were entirely spared. To the end of October, 180 persons were attacked, besides several

children; and, towards the end of the epidemic, two persons were attacked who lived in the houses which did not have the water from the common spring. The proof that the "spring-wasser" had distributed the "infectious matter" was based on the following:—Stockholden is a hill 300 feet high; its westerly spur extends into a little side valley. Through this little valley runs the Furler streamlet, which beyond the village of Lausen ends in the "Ergolz." In the Furler valley were some scattered farm-houses. In one of these farm-houses, in June and July, two persons were attacked with typhoid, and later on two others. The latrines of these houses were all in direct connexion with the brook, but this opens into the Ergolz below Lausen. After accurate inquiry it was found, however, that the Furler brook communicated directly with the spring descending from the Stockholden. It was known to the inhabitants of Lausen that when the meadows in the Furler valley were watered, the spring increased in amount; besides, about ten years ago, 100 paces below the infected houses in Furler valley, the upper-earth strata had fallen in, and formed a large opening, into which some of the water of the Furler brook flowed without again reappearing. After the hay harvest in July the meadows were water-manured, and the spring in Lausen shortly afterwards obtained a turbid and bad-tasting water. The ground was geologically explored, and when the above-named spring was dug up, salt water was poured into the Furler brook and made the spring in Lausen quite briny. As Professor Frankland puts it in his communication to *Nature*, the passage of water from the irrigated meadows to the spring at Lausen was proved by dissolving in it, at the meadows, eighteen hundred-weight of common salt, and then observing the rapid increase of chlorine in the spring water; but the most important and interesting experiment consisted in mixing uniformly with the water fifty hundred-weight of flour, not a trace of which made its way to the spring; showing that the water was filtered through the intervening earth, and did not pass by an underground channel. The conclusion is obvious—viz., the risk which attends the use, for dietetic purposes, of water to which even so-called purified sewage gains access, although, as in the case of Lausen, such water may be used with impunity until the moment when the sewage becomes impregnated with typhoid poison.

#### AN IMPROVED METHOD OF APPLYING THE MICRO-SPECTROSCOPIC TEST FOR BLOOD-STAINS.

DR. RICHARDSON, of Pennsylvania, who has paid so much attention to the size and characters of the blood-corpuscles, both red and white, has recently read a short paper before the biological and microscopical section of the Academy of Natural Sciences, in which he suggests an improved method of applying the micro-spectroscopic test for blood-stains. He points out the difficulties that are experienced in the ordinary mode of its application, and then proceeds to give the following directions: Procure a glass slide with a circular excavation in the middle, and moisten the edges of the cavity with a small drop of diluted glycerine. Thoroughly clean a thin glass cover, about one-eighth of an inch larger than the excavation, lay it on white paper, and upon it place the tiniest visi-



ble fragment of a freshly dried blood-clot, which need not weigh more than the 25,000th of a grain. Then with a cataract needle deposit on the centre of the cover near the blood spot a speck of glycerine not larger than a full stop ( . ), and with a dry needle gently push the blood to the brink of the microscopic pond, so that it may be just moistened by the glycerine. Finally, insert the slide upon the thin glass cover in such a manner that the glycerine edges of the cavity in the former may adhere to the margins of the latter, and turning the slide face upwards, transfer it to the stage of the microscope.

By this method an extremely minute quantity of a strong solution of hæmoglobin is obtained, the point of greatest density of which is readily found under a one-fourth objective, and tested by the adjustment of the spectroscopic eye-piece. Dr. Richardson states that in one case, five months after a murder had been committed, he was able to obtain well-marked absorption-bands, easily discriminated from those produced by a solution of alkanet root with alum and those caused by an infusion of cochineal with the same salt, from a scrap of stained muslin one-fiftieth of an inch square. After examining the spectrum, the white corpuscles and the remains of the red corpuscles may be discovered by the use of high powers, and it is possible, he thinks, in this way, by measurements carefully made, to discriminate between the corpuscles of human blood and those of the ox, pig, horse, and sheep. Lastly, to make assurance triply sure, he proceeds to wipe off the tiny drop of blood-solution from the glass with a thin piece of moistened blotting-paper, and allow to fall upon it a little fresh tincture of guaiacum and then a drop of ozonised ether, which will at once evoke the deep blue color of the guaiacum test for blood.

#### A REMARKABLE CASE OF ANEURISM.

On the 25th January, Mr. Oliver Pemberton, of Birmingham, tied the external iliac artery in a case presenting features of unusual occurrence and interest. The patient, a country gentleman of forty-seven, had led a life of great activity, especially in horse exercise; had been syphilitic, but was otherwise vigorous and healthy. Six months previously an aneurism formed in the left popliteal region; shortly after a second, at the apex of Scarpa's space; and when seen (Jan. 11th) by Mr. Pemberton there was a third under Poupart's ligament, all being in the same limb. The lower tumours were as large as the closed hand, and the upper the size of a goose-egg. The artery was secured about an inch from the bifurcation by an anti-septic ligature—which Professor Lister specially prepared by a new method which he has just devised, and which, as soon as he has perfected its details, he intends to bring before the notice of the profession. The immediate result of the operation was that all pulsation ceased in the three aneurisms, and has never returned (nine days having now elapsed). The patient is well, the pulse having never exceeded 84, and the wound without disturbance under antiseptic dressings.

It need hardly be said that the all-important question here was, to what extent would the collateral circulation be established? How much of the limb could be preserved from gangrene? Let the position of affairs for a moment be reviewed.

The main artery, extending from the seat of ligature below the bifurcation of the common iliac to a little above the origin of the anterior and posterior tibials, arrested, *at four distinct points*, by absolute barriers to circulation—*by one ligature* and three solid aneurisms! Despite these difficulties the existing conditions seem to assure the preservation of the limb to about the middle third of the leg, a marvellous instance of what collateral circulation can do when tried to its uttermost.

#### THE MODE OF DISTRIBUTION OF THE NERVE-FIBRES IN THE OPTIC NERVES AND IN THE RETINA.

M. NICATI, examining microscopically the optic nerves of mammals (man, dog, cat, rabbit) finds that the fasciculi of fibres, and the fibres contained in the fasciculi, remain parallel to one another, and do not decussate. Examination of the eyes of various birds showed that the optic nerve remains cylindrical up to the globe, but then becomes flattened, resembling a tube crushed at its extremity, and thus forming a straight and elongated papilla from the middle of which the pecten springs. The fasciculi forming the nerve arrange themselves as they traverse the sclerotic in a rectilinear series, and pass alternately inwards and outwards. In batrachia and pisces the optic papilla, as in birds, is linear and vertical; the nerve, as in birds, losing the cylindrical form it possessed in the passage through the orbit, and becoming flattened as it traverses the sclerotic. M. Nicati remarks, in passing, that the presence of an arteria centralis retinae, and corresponding venula, is limited to the eyes of mammals. As regards the distribution of the fibres in the retina of the frog, M. Nicati finds that from either side of the elongated papilla about a dozen fasciculi emanate; these spread themselves out upon the retina, dividing and subdividing, so as to form a series of triangles, the apices of which are at the papilla, whilst the bases are at the ora serrata. In each triangle the direction of the fibres is perfectly rectilinear. In the retina of man the fasciculi anastomose, leaving lozenge-shaped interspaces between them. Their direction is radiated and rectilinear in the internal half. In the external half some fibres, forming a very thin layer, pass directly to the macula; the fibres above and below these form a series of concentric circles around the macula, the external ones forming such gentle curves as to run in a radiated direction to the ora. These last fibres are thicker than the rest.

#### TABLESPOONS AND TEASPOONS.

A CORRESPONDENCE on a subject of great practical importance has recently been going on in the *Pharmaceutical Journal*. Mr. Proctor, of Newcastle-upon-Tyne, has pointed out some striking instances of the inconvenience and danger that may arise from the want of uniformity that at present obtains among medical men respecting the relative proportions of one tablespoonful and half an ounce. Modern tea- and table-spoons are much larger than those employed forty or fifty years ago, so that a tablespoonful should no longer be taken as representing half an ounce, nor a teaspoonful as equivalent to one drachm. As a fact,

however, there is a large number of prescribers, who, when they order half an ounce of medicine to be taken, mean by that one tablespoonful, and *vice versa*, while a few medical men regard half an ounce as equal only to a modern dessertspoonful. It is clear, therefore, that something should be done to ensure a common standard of measurement; and, as teaspoonfuls and tablespoonfuls will doubtless always continue to be most frequently employed for the purposes of dealing out doses of medicine, it would be well, as Mr. Martindale has suggested, to give a higher value to these measures. A tablespoon is now really equal to between five and six drachms, and the teaspoon is capable of holding from eighty to eighty-five drops, while the dessertspoon in present use comes up nearly to half an ounce. In ordering drugs in mixtures, and especially powerful or poisonous ones like strychnine and arsenical solutions, one tablespoonful should be looked upon as equal to six drachms, the dessertspoonful to four drachms, and the teaspoonful to a drachm and a half. A twelve-ounce bottle would, according to this, contain eight doses of two tablespoonfuls each, an eight-ounce bottle five similar doses, and a two-ounce bottle about eleven teaspoonful doses.

#### ACONITE.

DR. OULMONT recently communicated to the Académie de Médecine the results of a careful investigation into the "pharmaco-dynamic" properties of aconite. Struck by the variation in the action of different preparations, he instituted a series of experiments on dogs and comparative observations on man, with the object of ascertaining what are the active parts of aconite and what are the inactive portions, and of determining how far this activity is influenced by the physical condition of the plant, by its source, and by the way in which a preparation is made from it. He found that the action of aconite was largely influenced by each of these conditions. Speaking generally, the leaves, stalks, flowers, and seeds have a very slight and uncertain action; that, as was well known, the roots contain the active principle, but that the activity of the roots varies according to their source. Garden aconite is less active than that of the mountains, and that of the Vosges less active than the Swiss plant.

Alcoholic extracts of the fresh leaves, stalks, flowers, and seeds are, he found, almost inert in small doses. Thirty or forty grammes may be given to an animal and fifteen or twenty to a man without appreciable effect. Alcoholic extracts of the fresh roots are far more powerful, but so variable in their effect (owing, he believes, to the varying amount of water in the roots), that they should only be prescribed in very small doses. The tinctures of the root are also active enough, but very uncertain. Much the most reliable preparation, he concludes, is the extract of the dried roots. It contains all the active principles of the plant, its action is equal and regular, and it may very conveniently be administered in small quantities. A third of a grain a day may be administered, and gradually increased to one grain or even more.

#### THE PHYSIOLOGICAL ACTION OF VANADIUM.

AN interesting account of some experiments with this rare metal, made by Mr. John Priestley Platt, physiological scholar at the Owens College, Manchester, was read at a recent meeting of the Royal Society. Vanadium is nearly allied chemically to phosphorus and arsenic, but it seems to differ in many points from both of these substances in physiological action. Dilute solutions of sodium vanadate were found best suited for experimental purposes, and were injected into the veins, alimentary canal, and subcutaneously. However introduced, vanadium was found to be an active poison. In fatal doses the most noteworthy symptoms were paralysis of motion, local or general convulsions, rapidly supervening drowsiness, congestion of the alimentary mucous membrane, depression of temperature, intermittent respiration, and feebleness of pulse. The heart preserved its irritability throughout, and there was no impairment of consciousness or of sensibility to pain. With regard to special functions, Mr. Priestley arrived at the following conclusions:—1. That sodium vanadate acts both on the vaso-motor centre and on the intra-cardiac nervous mechanism, producing diminution of blood-pressure, disappearance of respiration-curves, feebleness, irregularity, and intermittency of the pulse. 2. That it acts on the respiratory nervous centres, causing a stimulation and then a depression of the respiratory movements, which sometimes become intermittent. 3. That it has no effect on nerve-trunks or their peripheral terminations, but exerts its influence on the central system of the spinal cord. 4. That it has no direct action on muscle.

#### TREATMENT OF AORTIC ANEURISM BY GALVANO-PUNCTURE.

THIS method of treatment is sufficiently rare to justify our calling attention to a case now under the care of Dr. Balthazar Foster, in the General Hospital, Birmingham, in which the operation, performed by Mr. Goodall, has so far been attended with considerable amelioration of the symptoms. On Tuesday, February 8th, galvano-puncture was performed on a man aged forty-five, who had, it appears, suffered from an aneurism of the ascending thoracic aorta for about eighteen months. The aneurism was punctured by two insulated needles connected with the positive pole of six (and afterwards eight) cells of Foveaux's battery, while an ordinary sponge electrode attached to the negative pole was applied to the skin in the immediate neighborhood. The current was kept up for three-quarters of an hour without any manifest inconvenience to the patient. At the time there was no visible alteration in the tumour, but by the third day afterwards there was considerable improvement, in the following respects—viz., the local prominence and pulsation had disappeared; the general pulsation of the precordia had greatly diminished; and both the consistence of the tumour and the resistance of the thoracic parietes had much increased. The operation will probably be repeated on Friday, the 18th inst., and the result will be watched with great interest.

## INFECTION BY SPLENIC FEVER (MILZBRAND).

At a recent meeting of the Medical Society of Königsberg, in East Prussia, Dr. Baumgarten, of the University Hospital, demonstrated the preparation of a spinal cord in which the sheath and the connective tissue around the bloodvessels of the grey substance, and in a lesser degree also of the white marrow, presented a peculiar glossy swelling. The individual from whom the specimen was taken showed in his blood a large quantity of bacteria, especially numerous in the blood of the heart, the same being also present in the other liquids of the fresh tissues. These bacteria had absolutely nothing to do with those in decomposing bodies, but were remarkably similar to a kind of parasitic forms which Dr. Baumgarten some time ago had found in the blood of horses affected with milzbrand. On inquiry, it was ascertained that the patient, three weeks before his fatal disease, had been rubbed by his wife with horse grease which she had bought at a knackery. At this same establishment those horses had been dissected from which the examined blood was obtained. The skin of the sick man was not diseased. Dr. Baumgarten leaves it doubtful if the affection of the spinal cord was caused by the parasitic growth in the blood and juices of the body. According to a note in the *B. Klin. Wochenschr.*, the paper will be published in *extenso* in the *Archiv fuer Heilkunde*.

## INOCULATION OF TUBERCLE.

M. METZGER, of Montbozon, has repeated the experiments on the inoculation of tuberculous material which have been very frequently made during the past ten years, and has communicated the results to the Académie de Médecine. Thirty-one of his experiments with non-tuberculous substances show that by the inoculation of such material lesions may be produced identical with those caused by the inoculation of tubercle, and in thirteen the nodules produced underwent absorption. It is only necessary to introduce a solid substance of sufficient size, easily breaking up and putrid, or impregnated with putrid liquid, to determine organic changes in the lungs, commonly but erroneously regarded as tuberculous. That they are distinct is proved by their common origin in the inoculation of different substances, by their capability of absorption (?), and by the fact that such changes result from the inoculation of tuberculous material only when it is in a state of advanced decomposition. These results for the most part corroborate the conclusions arrived at some years since by many experimenters.

## THE UTERINE SOUFFLE AND THE FETAL HEART.

SINCE Frankenhauser published the result of his observations on the rapidity of the foetal pulse in the diagnosis of the sex of the foetus, a considerable interest has attached to this subject. The result of investigations has been in some cases, but not in all, to confirm the observation of Frankenhauser. Dr. Cumming has made careful inquiries into this subject, and finding that the relation stated by Frankenhauser did by no means invari-

bly exist, turned his attention to other aspects of the matter, and has come to the following conclusions:—1. That the indications resulting from auscultation of the foetal heart are of a certain value in aiding us to diagnosis of the sex of the foetus in utero, but cannot solely be relied upon. 2. That there seems to be a relation (or ratio) between the weight and the pulsations of the foetus in utero. 3. That for the weight per pound, the pulsations are slower in the male than in the female. 4. That there is no relation between the foetal and maternal pulse.

## DEATH FROM SEPTIC INOCULATION.

THE danger of inoculation with the products of gangrenous inflammation ought to be more generally known, and to ensure great caution. Members of our own profession are frequent sufferers from that source, sometimes by unavoidable accident, sometimes through carelessness. All who have to do with the dead are exposed to the same risk, although usually in slighter degree. A woman has just died in the Isle of Man from such inoculation. She was called to lay out the body of a person who had died of gangrenous erysipelas of the arm, the result of a cut. The woman, having pricked her finger with a thorn, hesitated, but ultimately undertook the duty. Subsequently she showed symptoms of blood-poisoning, which ended in her death. Those who have to attend such cases cannot be too careful to avoid exposing an unprotected abrasion to contact with the body.

## THE TRANSPLANTATION AND IMPLANTATION OF HAIRS.

AN interesting paper on this subject appears in the *Zeitschrift fur Biologie* (Band xi. Heft 3), from the pen of Dr. Ernst Schwenger of Munich. He gives the following as the results of his numerous experiments:—First, that hairs that have been recently extracted and to the root of which cell-layers of the root-sheath still remain adherent, if brought into contact with freshly granulating surface, are capable of contracting adhesions with this, and that from this point a process of skinning over may commence, as after cutaneous transplantation. He has further shown that such hair root-sheaths can attach themselves to the iris and continue to grow. The iris therefore constitutes an excellent place for conducting experimental researches of this nature.

## New Inventions

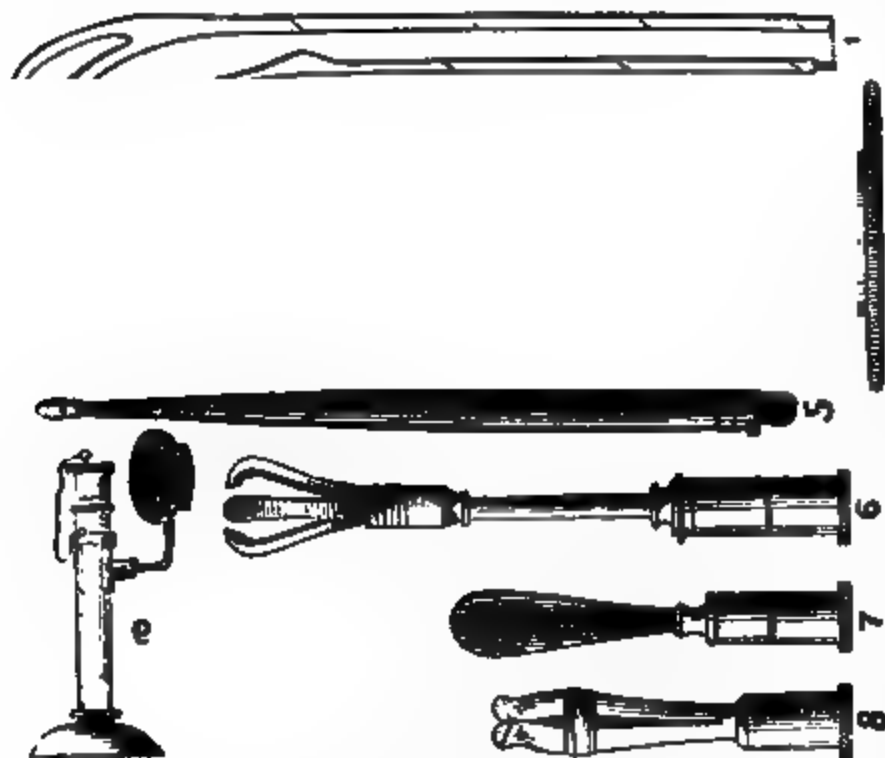
IN AID OF THE

PRACTICE OF MEDICINE AND SURGERY.

## NEW SPECULUM VAGINÆ.

WE have examined the new speculum of Messrs. Salt and Son, of Birmingham, and find it a com-

compact and convenient instrument. The novelty and utility of this invention consist in the economising of space, by arranging for the supply of a number of instruments in constant request by the obstetrician, without any increase in the bulk of the speculum. All the instruments illustrated below (except the lamp) are contained within the introductory plug, hereafter described. The speculum consists of two tapered metal tubes (Nos. 2 and 3), highly polished for reflection, fitting the one within the other, and capable of being used independently; thus forming two specula of consecutive sizes. Both have a lateral opening, as seen in the engraving; the inner one may, by rotation, close the lateral opening wholly or in part, so that any desired surface of the vaginal walls can be exposed for inspection or operation. The plug (No. 4) fits accurately the inner speculum, and has its end "coned," to facilitate introduction. It is closed at its larger extremity by a movable metal cap, which serves as a reflector for a candle-lamp. The complete speculum is contained in a neat leather case, and occupies, with the following instruments, no more space than an ordinary Ferguson's speculum:—1. Simpson's sound, united by a



screw or hinge-joint to a fenestrated elevator (No. 1). 2. Port-caustique, lancet, and sponge-holder (Nos. 6, 7, and 8), each fitting into a porcupine-quill handle of suitable length (No. 5). 3. Candle-lamp and reflector (No. 9). 4. Sponge and laminae tents.

## News Items, Medical Facts, &c.

**A BULLET IN THE LEFT VENTRICLE.**—At a late meeting of the Surgical Society of Paris, M. Tillaux presented the heart of a woman who had been shot twice with a revolver on October 7th. The bullets measured three lines in diameter. One was found lying on the diaphragmatic pleura of the right side, and had given rise to an abscess of the liver. The other had run through the right lung, had penetrated the heart by the posterior wall of the left ventricle, and was found lodged in the latter. The patient lived eighteen days with this foreign body in the ventricular cavity, and

nothing during life led to the suspicion that such a lesion had taken place. The heart was several times auscultated, and no information was obtained, the pulse being throughout regular. The hole made by the ball could hardly be made out, showing that cicatrization had been rapid and complete. M. Tillaux knew that two bullets had penetrated the chest, and discovered the second by mere chance, after having looked for it in the lungs and mediastina.

**TREATMENT OF LIPOMA.**—Dr. Hasse, of Nordhausen, injects these tumours with alcohol. A certain amount of the latter should be made to enter the fatty growth through several apertures, allowing some days to intervene between each injection. The tumour then softens and fluctuates; and the operator should at that period incise the growth and empty it, by means of gentle pressure, of the oily liquid which has been formed. Febrile reaction is generally very slight. It is hardly worth while in some fatty tumours to subject the patient to numerous punctures and injections, which may be more or less painful, and crown all by an incision and kneading of the tumour. In very large lipomatous growths, where enucleation leaves a deep cavity, which is sometimes a long time in healing, and where the incision must be large, and the tearing out requires a certain amount of force and manipulation, Dr. Hasse's system may perhaps be applicable, especially with timid patients.

**ATMOSPHERIC GERMS.**—Professor Tyndall, in his lecture on the "Optical Department of the Atmosphere with reference to the Phenomena of Putrefaction and Infection," delivered at the Royal Institution on the 14th January, gave the results of some important experiments he had made bearing on the question of spontaneous generation. The ascertained fact that air kept at rest in an enclosed vessel will deposit all its mites and become pure, led Dr. Tyndall to the conclusion that the germ-spreading and light-scattering power of the atmosphere are closely associated. The fact was also utilised by him in the conduct of his experiments with the view of determining whether the presence of germs was essential to the production of life in various infusions. The conclusion derived by the professor from the results of these experiments—which were carried out by means of air-tight tubes—was unfavorable to the theory of spontaneous generation.

**A NEW MEDICINE.**—At the last annual meeting of the Medical Society of the State of Virginia, Dr. W. F. Barr called the attention of the fellows of the Society to a new preparation of "iron and alum," manufactured in Washington county, Virginia, from the waters of "seven mineral springs." It is made by evaporation, and the analyses of Professors J. W. Mallett, of the University of Virginia, and Antisell, of the Smithsonian Institute, D.C., find it to consist chiefly of iron, alumina, magnesia, glauber salts, and lime. This medicine had been prescribed by the physicians of the South-western section of the State, and found to be an excellent tonic and alterative. One advantage it has over the ordinary ferruginous preparations is, that it does not constipate the bowels; on the contrary, it acts as an aperient. It has been endorsed and recommended by the Abingdon Academy of Medicine "as a valuable contribution to materia medica."

The December number of the *New York Medical Journal* contains a description of a case in which abscess of the liver opened into the pleura and bronchus. During life the man suffered from diarrhoea, and complained of pain in the chest. At the autopsy the right pleural cavity was found full of pus, with a few threads of "gangrenous tissue." The lung was bound down to the diaphragm by adhesions. The liver contained a large abscess, which opened into the pleura. The mucous membrane of the large intestines from the anus to the ileum was the seat of ulcers from half an inch to an inch in extent, with gangrenous bases, and separated from one another by portions of healthy tissue.

PRINTED AND PUBLISHED BY

WM. C. HERALD, No. 32 JOHN ST., NEW YORK.

# THE LANCET.

A Journal of British and Foreign Medicine, Physiology, Surgery,  
Chemistry, Criticism, Literature, and News.

JAMES G. WAKLEY, M.D., M.R.C.S., EDITOR.

PUBLISHED MONTHLY.

No. 6.

NEW YORK, JUNE, 1876.

## Clinical Demonstrations

OF

## PHTHISIS.

*Delivered at the Hospital for Consumption  
and Diseases of the Chest, Brompton.*

By JAMES EDWARD POLLOCK, M.D., F.R.C.P.,

Senior Physician to the Hospital.

### LECTURE I.

GENTLEMEN,—I know of no subject more difficult of clinical illustration than phthisis. This is partly due to a shifting pathology, which must be followed if we are to keep pace with the increasing knowledge of the day. It also arises from the difficulty of illustrating living cases by post-mortem appearances, and this again is due to the rapid changes undergone by the morbid product in the lung. These changes, as you are aware, are partly chemical and partly vital, and the life of tubercle is short, although the life of the patient may be long. Still, it is so highly necessary to rational clinical teaching that we should associate pathological changes of structure with the living phenomena of disease, that before proceeding to the wards I have endeavored to arrange the pathology of the day with the natural classes of phthisis. In this I have been partially successful. Yet there are many cases in practice of which we cannot say with certainty to what form of phthisis they have originally belonged, or what morbid influence has given rise to them. If I were to clear up this uncertainty by a dogmatic classification, I should deceive you and myself, but if I can throw the several varieties of this multiform disease into some natural groups, I shall have helped you to a better understanding of that which you see in the wards.

Let me therefore briefly review the leading points of the teaching of the last thirty years about consumption. In my early days the doctrines of Laennec ruled Western Europe. The grey granulations, semi-transparent, disseminated, or grouped in the lung, were the essence of the disease. They

were considered as new formation, not old tissue. From their inherent tendency to degenerate and decay they became caseous—what we now call fatty degeneration,—softened and ulcerated the lung, and formed a cavity more or less large in which all the lung tissues were merged and destroyed. Laennec was opposed by Broussais, who advocated the inflammatory origin of this as of most diseases. Heat of opposition and strong argument are not, as you are aware, likely to beget changes of opinion, and the two rival theorists did not modify their views and strike a balance, whereby we might perhaps have been gainers. At all events, Laennec's theory had this merit, that it harmonised remarkably with clinical experience or the living forms of disease.

But in this country there have always been independent observers, and Addison, Stokes, and others recognised the fact that in many cases of phthisis inflammatory products played a chief part, while in many others no tubercle at all was to be found. A more careful microscopical examination has done much for us, unsettled some of our views, and, without doubt, created uncertainties; but it has also clearly proved that some of our forms of tubercle, and of those, too, which ulcerate and break up the lung, originated in inflammatory action, and consist of inflammatory products. Still later Burdon-Sanderson, who I am proud to think was one of our colleagues, advanced the opinion that tubercle, or the *materies morbi* in consumption, is only a hyperplasia or overgrowth of the natural structure found in all lymphatic glands, in the lung surrounding the vessels and air-cells and entering into the interlobular tissue; found also, as we know, in the omentum, peritoncum, and spleen. This he calls *adenoid*, and he holds that it is subject to degenerative changes, may liquefy, soften, and be expectorated, or become caseous without softening, and dry up or become cretaceous. It will do all, in fact, which the so-called tubercle is known to undergo. It is capable of another change also—it is convertible into or causes the hypergrowth of *fibrous or fibroid tissue*, which is found naturally in the lung. This fibroid plays an important part in all old cases of slow phthisis. It extends through the lung, surrounds and strangles the bronchioles and vessels, furnishes walls to cavities, and branches through the lung in all directions to the pleura.

It binds together and consolidates all tissues and contracts the lung, causing the chest-walls to fall in. Of this form of disease I shall have occasion to speak again. Out of these several pathological conditions arises a somewhat natural classification, of which we shall avail ourselves. But first we must have a definition of phthisis which will fit all cases. We will call it a disease which ulcerates the lung and wastes the tissues of the body. It is not merely a lung disease either in antecedent history or in actual symptoms. Local and constitutional disorder coexist, and if there be such a thing as a purely local disease, it is surely not phthisis. Therefore it is not to be studied with the stethoscope only, nor to be appreciated by symptoms alone. To define the local disorder more minutely, we will say that it is a deposit or thickening in the lung, blocking its tissues, with great proneness to change or liquefaction, fatty degeneration or caseation. Till you get this there is no phthisis. Add coexistent irritative fever and waste of body, nutrition interfered with, and till you get this there is no phthisis. The diagnosis lies in the union of signs and symptoms. Auscultation may tell the amount and degree of lung disease, but not the vital cause nor the state of the patient. We are too proud of our stethoscopes! The most careful study of symptoms will fail at times to discover phthisis, although a practised eye will often tell the stage of established disease without examination.

We will take in order the forms of *phthisis of inflammatory origin*, and afterwards the *lymphatic*, and finally *fibroid* phthisis. But, first, I must say a few words about *acute miliary tuberculosis*. You do not often see it in these wards, for its rapidity and our delay in admitting patients exclude it. Patients die of this form of disease in a few weeks, I had almost said days. I need not therefore detain you long about it, for it is intractable and uninfluenced by treatment, and always fatal. There are two forms. 1. The *acute*, with rapid softening of a deposit which is spread through both lungs. A high temperature and pulse denote the excessive constitutional suffering. The physical signs spread over both sides reveal deposits and softening in its various stages at the same time. With these there are commonly gastric symptoms—red tongue, thirst, vomiting, anorexia—and delirium, which is rare in chronic phthisis, may occur before death. 2. The other form is a comparatively passive exudation, as it were, of miliary tubercle throughout both lungs which has no time to soften. But from exhaustion the patient rapidly sinks. The physical signs denote pretty uniform impaction of the lung—diminished resonance, feeble respiration, and lessened movements. I have seen this form prove fatal in three weeks, and the patient has scarcely coughed; but the temperature was high and the nervous exhaustion great. These cases, like the former, are uniformly fatal.

To facilitate our study of phthisis, I have drawn out for you a table (see next page), which will be found to include all varieties, from the lightest form of alveolar catarrh to the most advanced and chronic case. In constructing it I have had in view the modern theories, but it is not the less true that in one or other of these niches you may find all your cases in practice. The theory or the name may change, but facts remain and the often-repeated features of disease.

But first let me say that the eminent and in-

separable feature of phthisis is the localisation of the disease. Stokes used to say "localised bronchitis with dullness is phthisis"; and so is localised pneumonia which does not clear up within a certain time.

The very first on our list, *simple alveolar catarrh*, derives all its importance from its being limited to one part of the lung. If spread over the whole, or over both lungs, it becomes a bronchitis. A localised alveolar catarrh has often the notoriously insidious character of phthisis. Its approaches may be unannounced. With sub-febrile symptoms your patient will have slight cough, some wasting and impairment of strength. Your physical examination may or may not detect dullness, but harsh breath-sounds, and even crackle, are soon heard. He thinks he has a cold; you are uncertain whether he has not a consumption, for the case runs on for weeks, or even months. The physical state consists in a block of the minute tubes, thence to the alveoli, which become filled with cellular products. These disintegrate, become fluid, are expectorated, and he recovers. In more severe cases, the alveoli are blocked by large granular cells, which speedily undergo fatty degeneration, and are expectorated, but the walls of the alveoli are damaged and collapse, and the disease stops here. The chest-walls fall in slightly, there is some flattening and impaired movement, and the breath-sounds are deficient. There is, indeed, a small portion of lung not breathing at all. There is no tubercle in this case, and the patient recovers. But alveolar catarrh may have a second termination. The cellular products of disease undergo fatty degeneration, the fluid matters are absorbed, it becomes cheesy or cretaceous, and may remain so for years. This is one form of obsolescent tubercle.

#### PHTHISIS.

##### Acute tuberculosis.

1. Passive invasion of the whole lung by miliary tubercle.

2. Progressive deposits; rapid softening.

##### Simple alveolar catarrh.

1. Cellular products expectorated (recovery).

2. Alveolar products soften; collapse of walls (recovery).

3. Alveolar products remain, become caseous, cretaceous (obsolescent tubercle).

##### Catarrhal pneumonia.

##### Broncho-pneumonia.

##### Lobular pneumonia.

Alveolar walls, lung-tissue destroyed (cavity).

##### Lymphatic phthisis.

##### Adenoid (Sanderson).

##### Tubercle (Lacaze).

Overgrowth of lymphatic tissue; lobular pneumonia deposits; softening; vomica.

##### Fibroid phthisis.

Of various origin. Interstitial fibrous growth; contracted lung (chronic phthisis).

A *catarrhal pneumonia* is accompanied by a greater exudation of inflammatory products, which produce a more intense block of the lung. This is a broncho-pneumonia, or lobular pneumonia, often seen after pertussis and other acute affections of early life. It is limited to one portion of a lung. Not only the minutest bronchi, but the alveoli suffer, and their walls break down and liquefy. All tissues of the lung are ulcerated through, and

what is called a "cavity" is formed. These changes are accompanied by the most violent febrile symptoms, temperatures from  $101^{\circ}$  in the morning to  $104.6^{\circ}$  in the evening, followed by excessive sweatings, and accompanied by rapid wasting of tissues. All this may cease, as you will afterwards have occasion to see, and your patient may partially recover, and a dry cavity result, or a chronic secreting cavity, or a chronic extending cavity ending in secondary deposits in the lung and progressive waste. And of these various terminations I shall show you examples. Now bear in mind that all these forms of disease—that is, alveolar catarrh (mild or severe) or catarrhal pneumonia—may exist in local parts of the lung and yet there may be no tubercle according to modern pathology. At the same time these were the very changes in the lung well described by Laennec!

We come now in our list to consider *lymphatic phthisis*, with which I have classed the *adenoid* of Sanderson and the *tubercle* of Laennec. Tubercle properly so called is, according to modern teaching, a morbid growth of the lymphatic class, a hyperplasia of gland-tissue—not a new formation, nor an extraneous product, but an overgrowth of that which was always there. For, according to Burdon-Sanderson, adenoid tissue is found normally in the follicles of lymphatics, in the spleen surrounding the Malpighian follicles, in Peyer's glands, and in the lung around the bronchial tubes and the vessels which it accompanies. It is also found under the pleura, just as it is seen in the omentum and around the vessels of the peritoneum. Cell-formations in tubercle do not differ from inflammatory exudation, nor from these normally existing in lymphatic structures. An *overgrowth under irritation* is the term now applied to this extension of adenoid growth. It consists of grey granulations in the alveolar walls, in the connective tissue, around the vessels and under the mucous membrane of the bronchi, and is vascular. Its tendencies, the changes which it undergoes, are of the last importance to us, for in them we find the history of advancing or of retrogressive phthisis. Adenoid is capable of fatty degeneration, breaks up, liquefies, is removed; just as you see in the chronic or acute suppurations of lymphatic glands; for if you watch the external glands in suppuration, you have under your eye the changes which lymphatic tissue undergoes in the lung. Again, it is capable of fibrous transformation. It is convertible into fibrous tissue, in fact, and so furnishes walls to cavities in the lung, surrounds and obliterates vessels and bronchi, binds together and contracts the lung, and, as we see in all cases of chronic phthisis, preserves life for a time by conversion of the light vesicular lung, with its immense supply of blood, and ever-moving tissues, into a dense, almost impervious mass, scarcely capable of expansion, while it narrows and obliterates the blood and air conduits, and so arrests the circulation that hemorrhages are comparatively rare.

Burdon-Sanderson regards artificial tubercle, which, as you know, he produces in certain animals by inoculation, as an *overgrowth*, and not a new growth. And I will briefly state the results of his experiments on the rodents in order that you may compare them with what you see in phthisis. After inoculation the lungs are found disseminated with minute nodules of lobular catar-

ral pneumonia; the alveoli are choked with epithelial cells, and the alveolar walls are thickened by growth of adenoid tissue. These masses coalesce, and each one casates in its centre, becomes opaque and soft, and disintegrates; in fact, a vomica is formed. This result of inoculation is very like, indeed, almost identical with, that which takes place in ordinary tubercle in man. I am not here going to diverge into the question of the inoculability of tubercle in man—that is another question, not yet settled; but it is quite likely that primary deposits in the lung may propagate themselves by secondary deposits, the result of a kind of inoculation. These experiments on animals are of the very highest importance, inasmuch as they are pictures of an obscure disease producible at pleasure, and a disease, too, which we have hitherto been content to refer to that ill-defined power, constitutional disorder. In the present state of our knowledge, then, it is not to be forgotten that any morbid or septic matter introduced into the blood will produce effects on the lung like tubercle, and also that hitherto only one class of animals—the rodents—appear to be susceptible of such inoculation.

But you must bear in mind that other opinions besides those of Burdon-Sanderson prevail. Williams holds that tubercle is not a mere adenoid growth, but an excessive multiplication of perishable cells, or leucocytes, such as the corporcular lymph of Paget, and the croupous of Reikhsaueky. With these theories I have nothing to do now, my object being to give you intelligent clinical illustrations of phthisis, and to show you into what classes or varieties you may distribute the cases you meet with in the wards. The pathological theory may change, but the facts abide with us in indelible characters. These destructive forms of disease—the lymphatic, ordinary tuberculous, or pneumonic, including what was formerly called struma—may be fitly considered together, as they comprise most cases of ordinary phthisis.

I shall also ask your attention to still another form of phthisis, which includes several varieties. It has been called *fibrous or fibroid phthisis*, as it is characterised by an excessive interstitial fibrous growth. It has been considered as in itself a separate idiopathic disease, with such distinctive features as, in the opinion of some most careful observers, to entitle it to a different name and identity of its own. As I believe it to be the sequence and inevitable result of many forms of disease, and inseparable from several varieties of consumption, I must describe it to you as I have seen it, and can show it to you, as of various origin. Thus a catarrhal pneumonia attacks the fibrous stroma of the lung, or that interlobular tissue which gives sheath to the vessels and bronchi, and which underlies the pleura. Inflammation increases its growth—*growth under irritation*; and thus the vessels and bronchi become strangled, the alveoli collapse and are surrounded, and, when cavities form, their walls are provided with a fibrous covering. Trabeculae are left traversing the whole lung, which becomes contracted, and the side falls in and organs are displaced. In like manner all the forms of the lymphatic phthisis are attended in their more chronic stages by overdevelopment of fibrous tissue, producing contraction of portions of lung, and hardening and blocking its tissues. Indeed, I know of no form of phthisis, excepting the acute varieties (where there



is an invasion of tubercle throughout the pulmonary structures, in which the hyper-development of fibrous tissue does not occur. In the acute tuberculosis there is neither time nor (as it were) space for such overgrowth. The disease is too short, and it never reaches the period of fibrous transformation. But in the chronic forms, that which is called tubercle, or adenoid, by its very chronicity affords time and opportunity for such changes. For take the most advanced disease met with in the post-mortem room—examine that lung riddled from end to end by irregular cavities till no vesicular tissue remains in it, and what is it? Why, fibrous tissue and pigment; thickened, degenerated pleura; anfractuous cavities with more or less tough walls, obliterated vessels, and air-tubes crossed by bands of thickened tissue: all that remains, in fact, is converted fibrous stroma, without which, strong in its resistance to degenerative and ulcerative processes, there would be no lung left at all. Recognising fibrous change as the character of all chronic inflammatory and tuberculous disease, I cannot therefore teach you from this place that there is an idiopathic fibrosis of the lung which, from its very beginning, possesses separate and recognisable characters. There are, indeed, cases, which I shall hereafter show you, in which the fibrous becomes the preponderating element; but these have no features which totally separate them from ordinary chronic disease, and will be best treated as varieties with a common origin, and not as a separate class.

## LECTURE II.

GENTLEMEN,—When we last met we considered how far the modern pathology of tubercle and a clinical observation of phthisis can be made to agree. Theories change, and the fashion of the time, moulded, it may be, by the discoveries of the *jeunesse* of medicine, but the disease ever under your eyes has probably not altered from the days of Hippocrates till now. Its clinical varieties are well worthy your study, and, although you may not be able to tell at a glance the future of each, still there is a natural classification which will enable you to discriminate and assign fair reasons for your opinion. This knowledge is not to be found in a sorting of your cases into bundles, with a name attached to each, but rather to be sought in a careful clinical study. Thus you will find it abundantly demonstrable in these wards that there are many varieties of consumption, some of which become indefinitely prolonged, either from an inherent slowness to destructive change or because the local disease is limited, and the morbid action exhausted, as it were, in one circumscribed deposit, while others favor alterations in lung-tissue which convert its structure into an impervious mass, little influenced either by further inflammatory action or new deposits of morbid matters. Thus the *nature of the morbid products* in the lung is of primary importance in your prognosis, and the fact of the origin of the attack in acute inflammatory or in slower insidious forms of disease. Again, there are modifying agents which shape, as it were, the progress of the affection; and these are found in the age and constitution of the patient, in the build and shape of his chest, in the diffusion or massing of the deposit in the lung, and in certain of the occasional events of phthisis,

such as profuse hæmoptysis. I shall dwell on all of these, and show you specimens of each variety, and shall ask you to take good notice of the fact that some individuals evidence, by their plump, well-nourished condition, how tolerant the system may become of a very considerable amount of local disease, while others nearly perish from the constitutional irritative fever due to an affection, it may be, of one lung, limited in extent, but undergoing rapid softening.

The natural divisions of phthisis are, therefore, more numerous than the old three stages into which it was formerly divided; yet it is necessary to consider these, although they are erroneous guides to prognosis, inasmuch as they do not mean all that they appear to do. Many patients have strayed out of the condemned divisions, and in the third (and "last") stage have laughed at their doctors and proclaimed the fallacies of the "faculty." Patients will live with cavity in the lung for an indefinite number of years, or such an arrest of symptoms may occur in any stage as shall give time for a recovery of the nutritive processes. Only keep off the inflammatory attacks (for inflammation plays the most important part in the whole history of consumption), and if your patient preserve a healthy digestive system the stage of the disease is unimportant. Yet let us briefly examine these stages, which have their use and must be retained for purposes of study and accurate description, but do not mistake their meaning. They refer only to a state of lung, and not to a state of health. The *first* is the period of deposit or thickening of the lung, the *second* that of softening or disintegration, and the third that of *cavity*. The *first stage* of established disease of the lung—recognisable, that is, by physical signs denoting alterations in its structure—means such a block of a portion of the organ as shall render it less pervious to air. Hence the natural resonance which it gives on percussion is lost, the *intensity* of the air-sound as it enters is diminished, the *character* of the breath-sound is altered by the changed elasticity of the alveoli and minute tubes, and the air leaving the lung on *expiration* gives a more prolonged tone. The natural resonance of the voice and cough in the bronchial tubes is intensified and more directly conveyed to the ear, because the elastic and air-containing tissue of the lung is replaced by a solid medium which is a better conductor. It is obvious that this condition may be due to several causes either within or without the alveoli which have become closed up and impervious to air. An ordinary catarrhal pneumonia, resulting in proliferation of epithelial growths, will produce such an *intra-alveolar* block. The ultimate vesicles of the lung are filled up, the elasticity of their containing walls is destroyed, and what is called vesicular breathing is at an end, the entering air, when it reaches the ultimate bronchioles, being unable to penetrate further. Thus it is that the soft, gentle sound of pure respiration, which we hear in a healthy lung, is lost, and if the lung-block be considerable the breath-sounds are of necessity bronchial, being, in truth, only formed in the tubes, and not in the ultimate vesicles. It is safe to say that a large proportion of the cases which end in phthisis, or ulcerated lungs, begin in this way, by catarrhal products blocking the alveoli of a portion of the lung; and if you were to cut down on this diseased spot, you would not find the grey, semi-trans-

parent granules of Bayle, but the products of an inflammation. They have the same clinical history, but such alterations in the lung are not tuberculous, although you will find in practice that if not speedily liquefied and expectorated they either become caseous, and soften, breaking down the alveolar walls and ulcerating the lung-tissues, or, in certain cases, undergo the caseous transformation and become obsolescent. But, again, this pulmonary block may be *outside* the alveoli, and in that interstitial tissue which is spread through the lung—peribronchial and perivascular—that is, surrounding the vessels and bronchi, the *adenoid* or lymphatic tissue described by Dr. Burdon-Sanderson. It has been well demonstrated that it is capable of overgrowth from irritation, and in such circumstances it ceases to be the fine soft bed in which vessels are contained, and hardens, thickens, and compresses both the bronchi and alveoli, causing the collapse of the latter. The vessels are also enwrapped, as it were, lessened in calibre, and the circulation, both of air and blood, interrupted. In a later stage, as I shall show you, this process ends in producing what is called fibroid alterations, which both harden and contract the lung. This first stage of phthisis, then, consists in a block of the lung; and two causes can produce it—the intra-alveolar plugging by the products of inflammation, and the extra-alveolar pressure by the natural interlobular tissue becoming thickened. A third cause is more rarely found in what are called “dust” cases—the dust of coal-mines, factories, and potteries becoming impacted in the alveoli, and mechanically blocking the lung; and this is invariably accompanied by an overgrowth of the adenoid and fibrous tissues, and all such cases, when chronic, belong to the class of fibroid phthisis. Let us consider these causes of lung-block clinically. You may not be called to see the first approaches of such a case, but very often indeed you will find a patient with this history and physical condition of a part of one lung, generally the apex. He will tell you that he has had cough after taking cold some weeks or months previously. A feverish cold, with pain in one subclavicular region; cough, slight greyish starchy expectoration, some emaciation, and generally depressed health. On examination you find the chest-walls slightly flattened to the second or third rib, lessened expansion, slight dulness, and deficient breath-sounds. There may be a whiffy character of respiration, and slightly increased vocal resonance. What is this case? I believe it to be one of *severe alveolar catarrh*: the vessels have been blocked by large granular cells which have undergone fatty degeneration and been expectorated. But the walls of the alveoli have been damaged and collapsed, and a portion of lung is permanently blocked. This is not a tubercular case, and your patient may remain for years with the same physical signs, and without extension or even renewal of disease. We meet with them every day in practice. They are delicate, but perhaps have no cough. Yet they should live with care, for they carry with them a liability. Either a second attack may occur in a different part of the lung, or the old nidus of disease in the apex may break up, and the degenerated product be carried into the circulation, and the patient be inoculated with morbid matter, resulting in a second deposit, with accompanying hectic and all the history of phthisis. The above symptoms may

also, no doubt, approach insidiously, and with premonitory conditions obscure but intelligible to the observant; and this early stage has been much dwelt on. I have long believed that there are symptoms before there are physical signs, a systemic or constitutional condition before any local disease exists; and a very serious question arises here. Do the whole train of symptoms in phthisis, the hectic irritative fever, sweating, waste, and exhaustion, only depend on a localised lung disease, of which they are the reflection, and which stands to them in the relation of cause to effect, just as the diseased joint gives rise to suppurative hectic? or is there a primary constitutional disorder, of which the local disease is only a sequence, expression, and result? Would a healthy person ever have such an alveolar catarrh as I have described, resulting simply from a neglected cold, and without any previous disorder of health? It is true that by far the most important agent in precipitating lung disease is inflammation; but is the inflammation itself idiopathic, or has it arisen out of a previous condition of blood or tissues which have impressed on it a stamp and form, and made it not quite what we call a healthy inflammation? For there is a healthy inflammation, as you know, and is this it? “Certainly not,” you reply, “the products of healthy inflammation are temporary, plastic, removable, not permanent, ill-vitalised, degenerative, like these blocked alveoli.” Then why is it so? We all go through our severe colds and outlive them. Whence this insidious filling of the lung with epithelium granules, tubercle—what you will? or this acute localised patch of deposit after a few weeks’ fever, which will not organise, nor resolve, but remains to degenerate, ulcerate, waste? It is true that the fever in phthisis is generally a measure of the irritation of the lung, but is there no fever premonitory and leading the way to these lung alterations? I must answer in the words of Latham: “Pulmonary consumption is only a fragment of a great constitutional malady, which it belongs to a higher discipline than any mere skill in auscultation rightly to comprehend.” And as regards premonitory symptoms, I ask you to regard with much anxiety and grave care the *union of subfebrile symptoms with progressive waste of the body*. Here is danger without any physical signs, but if the latter be apperceived you have lung disease, and localised lung disease with fever is catarrhal pneumonia, tubercle, hyperplasia of adenoid—what you will, but, above all, it is phthisis.

In studying such a case you must exclude several causes which might mislead you. Emaciation may be due to dyspepsia, and cachexia from syphilis, diabetes, chronic abscess, joint affections, and fever, as well as other alterations of health. In all cases the rule should be to regard moderate fever of the remittent kind and wasting of the body with great suspicion.

Let us just consider the progress of a healthy atrophic pneumonia in contrast. Your patient, hitherto healthy, has been exposed to cold, generally rather severely, and after sweating. He shivers, and has an immediate rise of temperature to 103° or 104°. This is followed by moderate but rapidly-increasing dulness over one lung from the base upwards even to the apex. A fine crepitus succeeds, and the breath- and voice-sounds become tubular. Dyspnoea marks the lessened space for breath, and rusty sputa the extreme congestion in

the lung. There is little pain, but there is much fever and distress, and the patient has a burning skin and patches of redness on the male. On the seventeenth day, or later, a crisis occurs; the temperature drops suddenly; the physical signs alter, the dulness lessens, and a coarse crepitation replaces the fine. In an incredibly short time there is convalescence, and the lung-signs are normal. In this case no one can doubt that the lung-alveoli are blocked by exudation so thoroughly that, in fact, no tissue in the lung is pervious to air except the larger bronchi. But there is speedy resolution; the plastic exudation readily liquefies, resolves, and is absorbed and expectorated. It is plainly not the *extent*, but the *nature* of the lung deposit which is dangerous, and it is equally plain that the alveoli, although blocked and filled up, have not been injured, for we find that the recovery after such an attack is perfect, and the integrity and elasticity of their walls is complete. There is no ulceration of lung at all in the case, and the organ returns to a condition sound and pervious, with free elasticity, a perfect double circulation, and all functions unimpaired. Where, then, is the difference between this sthenic pneumonia and the alveolar disease which I have described as leading to phthisis, nay, as so often destructive of the lung and of the patient? Doubtless it is found in the nature of that diseased product which will not liquefy nor resolve, but precipitates destructive ulcerations of the surrounding tissues. And let us go a step further back, and ask why is not the product of disease a healthy, removable product? why is it low in organisation, liable to degenerative change, but not liable to such a complete and rapid form of degeneration as would remove it from its dangerous impaction in the lung? We are compelled here to seek an antecedent cause, which is higher up in the chain of morbid events, and we say, here was a "constitution," or an hereditary predisposition, which caused this inflammatory block in a portion of one lung to be of infinitely greater danger than the inflammatory block of a whole lung in another individual. I wish I could explain this to you; but here are the facts, and they are hard of interpretation, and we are driven to obscure terms like "diathesis" to cover our ignorance. But do not mistake me; up to this point all is clear, but behind it lies the field for future advances, and perhaps a lessened mortality.

Look at a case of unresolved pneumonia, and you see "phthisis." Such a case has generally not been sthenic, the temperature has not been excessive, and there have been variations looking like recovery. The dulness has not been complete, but in patches, and the locality of these patches has changed; one has partially cleared up, only to be replaced by another. The rusty sputa are rarely seen. I have said the pyrexia was less marked, but the fever changes its character into a slow remittent with the diurnal variation of phthisis; low temperature in the morning, and  $102^{\circ}$  in the evening. At the end of two or three months the case has not cleared up, and your patient is weak, emaciated, and has night-sweats. His lung (one lung) may be dull in parts at the base, much more rarely at the apex or in the middle near the root of the lung, and not only is the breath-sound tubular, but there is crepitus here and there. The medical attendant is alarmed,

and with reason, and says he would gladly have exchanged such a case for a true active pneumonia with much fever and high temperature, and complete block of a whole lung. In this opinion he is right. He will ask you anxiously in consultation if this be tubercle. I care not for names. It is a deposit in the lung which will not resolve, and which threatens to destroy the alveolar walls and to give rise to the train of symptoms which indicate ulcerated lung-tissue. I would have you carefully note the small portion of lung engaged as compared with a sthenic pneumonia, the deficiency in the resolution of the local disease, and the passage of pyrexial fever into hectic. Now we have brought our comparison of cases and our reasoning on them to this point, that the difference between the unresolved pneumonia and the catarrhal block of the alveoli or the old localised deposit of tubercle—call it which you will—is in the nature of the product extended into and around the alveoli, and not in the extent of lung engaged. For in the first case you have a commencing phthisis, and in the latter you have a very acute disorder, with ten times the amount of local mischief, and yet complete recovery is almost sure to follow. Histology will not unravel the difference between the two cases, and it will not do to look through a microscope or listen through a stethoscope for the cause. The histological appearances and the physical signs are nearly identical in the two cases, and hence I ask you to examine deeply and carefully into the vital phenomena and the antecedent history of the two cases, and trace how the feeble constitution with inherited tendencies produces a distinctive product in the lung, and how the healthy is enabled to battle against an infiltration of a whole lung successfully.

It was perhaps best to consider these questions while examining what has been called the first stage of phthisis, or that which is characterized by a morbid product in a portion of the lung. If we could define the pathology of this stage, we should have accomplished the most difficult part of our task.

One symptom to note in phthisis is, that not unfrequently an hæmoptysis ushers it in; and it is true that some of the more rapid forms of phthisis are so commenced. A patient, overworked, it may be, or enfeebled by anxiety or other depressing agents, will bring up a mouthful of blood, and soon present all the physical signs and the fever and waste of phthisis. In such an event you must watch the temperature and pulse quite as much as the physical signs, and if much fever, with an evening temperature of  $102^{\circ}$  or  $103^{\circ}$  prevail, and morning sweats, the case is likely to be rapid in its changes for the worse, even without pause, till a cavity is formed; or progressive softening of the lung may occur, and the case become one of galloping consumption. This event is to be looked for, but is not an invariable sequence of a rather profuse hæmoptysis occurring as an early symptom. Its meaning is undoubtedly great congestion of the lung, and we must remember that rapid softening occurs often. Either inflammatory products block the alveoli, or, as has been said, retained clots of blood form the nuclei of degeneration, and in their changes involve the lung-tissue itself.

Not all these cases so initiated do badly, but many pass into the chronic stage, exhibiting little

tendency to degenerate or ulcerate the lung, and the symptoms, although primarily severe, may subside, and leave only the signs of a quiescent block of a portion of lung, while the patient recovers a fair condition of health. An hæmoptysis depletes the lung and relieves the congestion, as I shall have occasion to point out to you again, and its occurrence is often followed by a long period of quiescence or latency of disease.

## A Clinical Lecture

ON THE

### TREATMENT OF INCIPIENT STRICTURE BY OTIS'S OPERATION.

*Delivered at University College Hospital,  
March, 16th, 1876,*

By **BREXLEY HILL,**

Professor of Clinical Surgery in University College.

GENTLEMEN,—In a lecture which I had the honor of delivering before you more than a year ago\* I endeavored to describe and classify the various causes of the scanty urethral discharge known by the term "gleet." I pointed out that, produced by affections of very different nature and in different parts of the urethra, these discharges required very distinct kinds of treatment for their cure. I still adhere to that opinion—one common to most who study urinary disorders.

Last July, you recollect, Dr. Fessenden N. Otis, a distinguished surgeon of New York, demonstrated in our operating theatre his mode of curing gleet and stricture of the urethra, in a lecture remarkable for its clearness and for the skill with which his manipulations were performed. In that exposition Dr. Otis enunciated views which vary considerably from, and indeed are opposite to, the doctrines usually taught in this country. I propose to-day to examine what we were told on that occasion with the light that some experience we have been able to gain in our own hospital has thrown upon it. In doing this I would not have you suppose that there was little to be learned from our American *confrères*; on the contrary, I am satisfied that much of what he told us is perfectly true, and a real contribution to our knowledge of urethral affections.

The chief points of Dr. Otis's demonstrations were:—

1. The human urethra varies much in its calibre in different persons. Hence an instrument that is a full size for one man may be either much too great or too small for another.

2. The urethra is really much wider than is generally taught.

3. The meatus urinarius is normally as wide as the rest of the canal.

4. Gleet is always due to stricture. It is "the signal that nature hangs out to call attention to the fact that stricture exists somewhere."

5. In the term stricture Dr. Otis includes those

early indurations which have not sufficiently advanced to interfere with the passage of urine or to produce any symptom beyond a discharge. But he maintains them to be really bands of contractile tissue-fibres produced by inflammatory action.

6. Stricture is most frequent in the first inch from the meatus, and is less frequent as the distance from the entry increases.

7. Complete division of a stricture and maintenance of the incised part at its natural width until the incision is thoroughly healed prevents return of the contraction, and, moreover, *causes absorption of the indurated tissue from the affected part.*

I propose to examine these novelties one by one.

That the urethra should vary in calibre in different persons, considering that the penis also varies greatly, might well be presumed *a priori*; and Dr. Otis has most satisfactorily demonstrated that it does so. But I trust you have not forgotten the description of the urethra given by Sir Henry Thompson in his lectures to you before Christmas. He there showed how the urethra is not a tube at all except while some body is passing along it, and defined it to be a *closed valvular chink*, capable of distension to a different amount in different parts of its length. It will be well to bear this in mind, and also that for our purpose to-day we are concerned only with the *spongy portion* of the urethra.

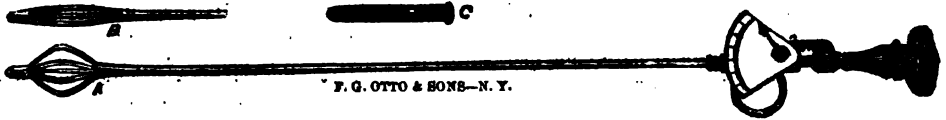
Books on anatomy tell us that the bulbous portion is somewhat wider than the rest, having a circumference of seven-tenths of an inch, and that the remaining part is one or two tenths less in circumference; further, that the meatus does not exceed one-quarter of an inch in width. These measurements are doubtless taken from the dead body, and if we conclude that they represent the dimensions of the living urethra, we shall be in error. The practical importance of ascertaining what is the usual extent to which the valvular "chink" is dilated during micturition is this: diminution of capacity in the urethra means impediment to the flow of urine from the bladder. If the balance between the natural expulsive force of the bladder and the friction of the stream along the urethra is disturbed, the bladder is irritated, the kidneys are affected, and the beginning of the long chain of events, which terminate not infrequently in death, is made. To know if a man has stricture, we must first know what the natural distensible power of his urethra is, and to ascertain this, Dr. Otis discarded any arbitrary standard, which, you know, is usually set at about No. 12 of the English scale, but measures each urethra before he proceeds to operate upon it. For this purpose he has invented a most ingenious instrument which he calls the "urethrometer." It consists of a slender canula marked in inches, at the end of which a set of steel springs can be expanded into a bulb by advancing a stem within the canula. This movement is obtained by turning a screw at the handle, and the amount of expansion is recorded by an index on a dial-plate. When screwed close the instrument is not larger than a No. 6 English sound—that is, a circumference of less than half an inch. It can be expanded to a maximum circumference of an inch and three-quarters—two and a half times the seven-tenths of an inch which your anatomical guides tell you is the circumference of the widest part of the spongy portion. To measure the urethra the expanding sound, covered by a thin

\* Reported in THE LANCET, April No., 1875.

india-rubber sheath (q. Fig. 1), is introduced in its contracted form as far as the bulb, between five and six inches. It is then screwed up until the pa-

spread out before you. They have a slender stem of about four millimetres screwed into the wider end of a bulb or bullet. The best shape for the

FIG. 1.

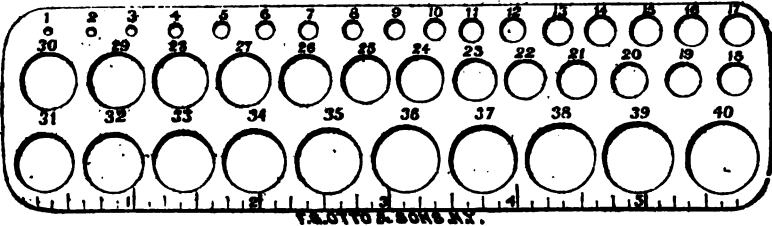


Otis's Urethrometer.

tient announces he has a sense of fullness, but not so tightly that the instrument cannot be moved without being grasped by the passage. This gives

bulb is that of a turkey's egg, which you know is a little more pointed at the small end than the egg of a common hen. The bulbs range in size from

FIG. 2.



The Catheter-gauge.

the size of the canal at the bulbous part. The urethrometer is gently withdrawn, the expanding part being enlarged or diminished as tight places or slack ones are passed, and the several dimensions are noted by observing the index, and the distance of the expanding part from the meatus. Any diminution from the widest measurement Dr. Otis holds to be a stricture and abnormal. For the further examination of these contracted areas, Dr. Otis employs a series of bulbous sounds ranging from about No. 4 English catheter to one much greater than any size in our scale. But before describing them I must remind you that Dr. Otis, like nearly all who work at urethral affections, has discarded the English scale, one entirely arbitrary, ascending from the smaller to the higher numbers by wide grades of unequal length. He chooses the French scale, which is perfectly scientific. It takes the millimetre for its unit, and the number of the instrument denotes its circumference in millimetres. Thus No. 1 French is one millimetre in circumference; No. 20, twenty millimetres; and so on. Compared with these, No. 1 English is equal to No. 3 French, and No. 11 English to No. 20 French. Here is a gauge Mayer and Meltzer have made for me, with forty sizes cut in the plate. The plate is marked on one side with the French numerals, and also graduated with a decimetre divided into centimetres and millimetres. On the other side, the English numerals are marked opposite their respective sizes, and there is also a scale of six inches, divided into sixteenths of an inch. Thus, the catheter-gauge forms a ready means for comparing French with English meas-

No. 8 to No. 40. Their number corresponds to the big end.

With these instruments Dr. Otis has measured over 500 urethrae, from which he tells us that the expanding capacity of the urethra bears a constant ratio to the circumference of the penis below the glans. Hence if you measure the outside of the penis you can foretell the size of the urethra. Further, that the average size is between thirty-one and thirty-two millimetres, or an inch and a quarter—that is, more than half as large again as the measurement hitherto accepted. From these observations also Dr. Otis finds that the meatus, when not congenitally narrowed or contracted by balanitis in boyhood, a frequent occurrence, is as wide as the rest of the urethra. I have not measured a number of urethrae approaching to 500, but I will give you the results of my measurements so far as they go. Since last spring I have measured ninety-five urethrae (all of them in subjects of urinary disease by the way), and in only three did I find the meatus as wide as the rest of the canal. One of the three exceptions was that of a man who never had gonorrhoea, but an exceedingly narrow traumatic stricture of the bulbo-membranous part. In him No. 32 sound slid easily down to the stricture by its own weight. This would show that the meatus may be either normally narrower than the rest of the canal, or that morbid contraction is exceedingly common. Be that as it may, practically we have generally to deal with a narrow meatus, the average size being twenty-two millimetres. The measurement of these ninety-five urethrae has satisfied me that we have underestimated the size of the urethra, and that Dr. Otis is correct in claiming larger calibres for that canal. But I have not found the bore, so to speak—the capacity for distension, in more accurate diction,—to be uniform from the bulb to the meatus. At the bulbous part the urethra is widest, and remains of even width for about two inches. It then narrows gradually, and for the rest of the

FIG. 3.



The Bulbous Sound.

ures. Dr. Otis's series of bulbous sounds are

passage is about three millimetres less, being most narrow at the outlet. This is, as you well know, in agreement with the description of anatomists, only that the distensible capacity of the urethra measured in the living body was greater than the limits they set down. Thus the spongy urethra is conical in shape, resembling the tapering nozzle of a syringe. Whether this be a provision of nature to make the escaping stream more forcible I know not, but you will recollect that the special *raison d'être* of this part of the urethra is to conduct, not the urine, but the semen. Of this I am persuaded, that the less calibre of the urethra at this point is natural, and not the result of chronic inflammation, so long as it is gradual and not abrupt. Morbid narrowings are easily perceived by the sudden way in which they obstruct the bullet, and by the suddenness with which it is released when they are passed.

Next, with regard to the invariable presence of a non-dilatable area of the urethra, a band of contracting fibres—that is, a stricture of more or less development, in every case of gleet. I repeat that I still think that stricture in any shape is not the sole cause of gleet, though doubtless this is the most frequent condition in such cases.

With respect to stricture being most frequent in the first inch and a quarter of the urethra, out of 258 strictures, Dr. Otis found 115 within that distance of the meatus, and the remainder in decreasing frequency in each succeeding inch. This you know, is contrary to the received doctrine, which places stricture most frequently at the bulbo-membranous part. My experience does not support Dr. Otis's statement. In 1870 I recorded 68 strictures, examined with bulbous sounds, at the Male Lock Hospital in 1869, when I found them 43 times between four inches and a half and six inches—a position, allowing for variation in length of the passages in different persons, almost of the same in all.

Next, having ascertained the presence of some unnatural narrowing of the spongy urethra, does internal division cure it, and prevent its return or further development, and consequently cure the gleet? If we adopt Dr. Otis's teaching, our course is simple. A patient applies for cure of a gleet. His gleet must be the consequence of stricture. Find that stricture; cut completely through it to the erectile tissue, so as to make the urethra a little wider than before, and take care to maintain this artificial patency while the incision is healing: the cure is then complete and permanent. This is the result of operating in a large number of cases, a report of which has been published in several forms. In 100 published cases, 81 patients were found without recontraction when examined at a considerable period after operation; 52 others were not examined, but reported themselves well; the remaining 17 were not quite cured, though relieved. Such evidence induced me to give a trial to this method. I may state that all the cases operated on here were those of long-standing gleets with contraction in one or more parts of the spongy urethra, and had undergone multifarious treatment. The number of patients is sixteen: fifteen of my own and one of Dr. Otis's—the case on which he operated in our theatre on the 6th of July last. In five cases the gleet stopped after the operation, and the patient was at the last report—taken in none less than three weeks, in most some months, after the operation—able to pass a bougie of the estimated size of the urethra. In short, they may be claimed as cures. But of these five

the operation was serious to two; one had free bleeding for three days, the other three attacks of rigors. Of the remaining eleven, among whom Dr. Otis's own operation must be included, the gleet persisted in all; in several the urethra shrank again to its size before the operation, and in some very serious complications ensued. In four bleeding lasted several days, and in one was even alarming. Three patients had rigors; in two the shivering was unimportant, being that which follows the first transit of urine along the incised urethra in certain individuals, but is not repeated or attended by further consequences. In the third patient the rigors preceded abscess in the buttock. One patient had orchitis. Thus in seven the operation might fairly be termed a trifle, causing no pain or any after-fever; but in five only was the operation successful. It may be contended that want of practice on my part, or imperfect performance of the operation, were the causes of this small success. But I am protected against this danger by having had the benefit of Dr. Otis's personal instructions, and by the fact that one of the least successful cases was that in which Dr. Otis operated himself. The man was in sound health with the exception of his gleet and contraction of the urethra at two and a half inches from the orifice. He made light of the operation, submitting most patiently to the somewhat prolonged manipulations; being animated by the patriotic resolve, as he afterwards told us, that "No Yankee should make him flinch." The patient bled copiously after the operation; the hemorrhage not stopping altogether for six days. No other complication ensued, the man was able to get up as soon as the bleeding had stopped, and would have left the hospital at once if permitted. However, though he remained some weeks longer with us, and afterwards attended assiduously for the regular passage of the sound, his gleet persisted till Christmas, and was at last cured by other means. There still remains a scar or induration in the erectile tissue, which gives a crook to the organ during erection. Whether the division of the contracting band caused permanent absorption thereof in any of these patients I do not know, but have very little expectation that it did so. Certainly it failed of this effect in almost all.

When telling you, as those who frequent my wards already know, that I have abandoned this operation for curing gleets accompanying slight contraction of the urethra, I should not omit to tell you that in one point I have varied from Dr. Otis's operation. His urethrotome, which I hold in my hand, is used as follows:—The instrument is passed along the urethra until the end is well beyond the stricture. The instrument is then dilated until it stretches the urethra to its full capacity, or, to make sure, to one or two millimetres beyond that capacity. Next a small cutting edge, previously concealed, at the end of the dilating part, is drawn along the tightly-stretched tissue to the meatus. This long furrow is made in the mesial line in the roof of the urethra. Disliking this long cut, which divides uncontracted parts, as well as the strictured parts, I have employed, except in one case, a stricture incisor, which, while it stretches the urethra to the size previously determined, cuts only where it is strictured. Its mode of action I shall explain when speaking of the division of narrow strictures. As the contracted areas are as freely divided by this

plan of cutting, I cannot fairly charge it with the numerous failures that have attended Otis's plan of treating wide strictures.

The plan of treating these affections to which I have returned is that which I adopted before—namely, the repeated passage of bougies, large enough to distend the stricture, but not large enough to be tightly grasped. The size of the bougie is increased at each visit—that is, about twice a week—, to keep pace with the increasing expansion of the urethra until the capacity of the uncontracted parts is reached, when the same size is continued by the patient himself for several weeks longer. When the meatus is greatly smaller than the rest of the passage, I cut it either by Otis's meatome, this straight probe-pointed bistoury, or by a bistouri caché, to which Coxeter has added a second shield, which can be separated from the first by a screw-pin, and so make the fibres tight before they are divided. The incision is made in the floor, and must be pretty complete, as the little ring of fibres is very tough, and often needs two or three applications of the knife to divide it fairly.

But do not misunderstand me. I do not mean that every gleet requires instrumentation forthwith as a matter of course; on the contrary, avoid the use of instruments whenever you have satisfactory evidence that the discharge is not of long standing. The exact length of time that indicates stricture is uncertain, for the inflammatory induration constituting stricture is formed very slowly in some persons, but comparatively fast in others. As a general rule, don't search the canal when the discharge has lasted only six months or less. Be sure, however, that the whole duration of the discharge is really contained in six months, and that there have not been previously periods of clap or gleet to which the present discharge is only a successor. Several relapses of gleet are very strong evidence of stricture. Bear constantly in mind that the introduction of an instrument of any kind into the urethra is an evil, and though in time the canal gets accustomed to the foreign body, this, like many other faculties, is not acquired without discomfort or pain. Resort to instrumentation only when you are satisfied there is legitimate cause for it. Nevertheless, when you do employ instruments to search for stricture, use such as are adapted to the end in view; and at our next meeting I will explain to you why I prefer bulbous sounds and bougies to those of equal thickness throughout.

## Clinical Lectures

ON

### LISTER'S TREATMENT OF WOUNDS AND ABSCESSSES BY THE ANTISEPTIC METHOD.

By THOMAS SMITH, F.R.C.S.,

Surgeon to St. Bartholomew's Hospital.

#### LECTURE I.

GENTLEMEN,—As many of you are aware, I am endeavoring at the present time, with Mr. Vernon's

assistance, to carry out Mr. Lister's method of treating wounds antiseptically, and as some of you may be interested in the result, I propose in this lecture to explain, as briefly as I can, the theory upon which Lister's antiseptic treatment is based, the facts from which that theory is adduced, and the advantages Mr. Lister claims for the plan.

I shall not at present give the results of my experience, nor shall I now express any opinion as to the merits or demerits of this treatment. I would rather wait until a fuller experience justifies me in speaking with some authority.

In taking up a subject of this kind it is very difficult to avoid a spirit of partisanship, since on the one side there are surgeons whose opinion is entitled to respect who are opposed to the system, either on *a priori* grounds or in consequence of an unfavorable experience of its results; and on the other side are ranged those who have come to an opposite conclusion, and mostly after having put the plan to a practical test.

Under existing circumstances I should advise you to form your own independent opinions from your own observation of results. I intend to do so, and I propose to give the plan at least one year's trial, employing the treatment especially in what may be called test cases; I mean in cases where the antiseptic method is fairly put on its trial, and where an opportunity occurs for such advantages as it is said to possess to become plainly apparent.

There are two preliminary conditions which Mr. Lister has a right to demand of those who profess to make trial of his system: first, that they should at least provisionally accept his theory; secondly, that they should know what his practice is, and should carry it out even to the minutest particular. They must provisionally accept the theory, or the details of the practice will in some respects appear so frivolous that they are sure to be occasionally neglected; while if the soundness of the theory be accepted, it will be seen that the observance of these details is thoroughly reasonable. Mr. Lister has a right to insist that those who profess to give his practice a fair trial should observe its minutest details, since no one can be truly said to carry out Lister's plan who stops short in the execution of details prescribed by the author as necessary to success.

Now, in order to fulfil the first condition, I have, for the present at least, agreed to accept Mr. Lister's theory (what it is I will tell you directly). And lest I should fail in the second through a want of knowledge, I visited Edinburgh myself last summer, and had the advantage of personal instruction from Mr. Lister himself; and subsequently my house-surgeon, Mr. Vernon, was good enough to stay there for a time, when both Mr. Lister and Mr. Annandale gave him every opportunity of learning the practice of antiseptic surgery. These gentlemen not only succeeded in teaching Mr. Vernon the details of their treatment, but happily fired him with the enthusiasm necessary to carry them out with a good will on his return to London. Whatever may be the result of antiseptic surgery in my wards, I shall remain very much indebted to Mr. Lister, Mr. Annandale, and Mr. Vernon.

The theory, or, one may now say, the facts on which Mr. Lister's antiseptic treatment rests are as follows:—

1st. That in the dust of the atmosphere, and on



matter with which it is in contact, there are the germs of minute organisms which, under favorable circumstances, induce putrefaction in fluids and solids capable of that change, in the same manner as the yeast-plant occasions the alcoholic fermentation in a saccharine solution.

2nd. That putrefaction is not occasioned by the chemical action of oxygen or any other gas, but by the fermentative agency of these organisms.

3rd. That the vitality or potency of the germs can be destroyed by heat, and by various chemical substances, which we call, in surgery, "antiseptics."

Now, I am not going to ask you to believe these statements on my authority, but I will shortly refer to the results of experiments performed by Pasteur, Lister, Sanderson, Tyndall, and others, which justify the above conclusions.

It is scarcely necessary to state that organic fluids, like milk, urine, and blood, infusion of meat, &c., if kept in contact with the air at ordinary temperatures, will ere long decompose or putrefy, and will give evidence of putrefaction by turbidity (if the fluid be originally clear), by the evolution of offensive gases, and by the development within them of bacteria.

Again, I need do no more than remind you that prolonged boiling will not of itself preserve such fluids from putrefaction. Yet any of these or similar fluids may be kept free from putrefaction for an indefinite time, in spite of free access of the atmospheric gases, provided that the fluid has been boiled at the outset to destroy any organisms in it, and that the vessel containing it has been thoroughly purified by heat, and that the dust of the air is excluded. The exclusion of the dust may be effected in various ways. In some of Pasteur's first experiments it was done by having the neck of the flask which contained the liquid drawn out by aid of heat into a fine tube bent at various angles, in which form, though open at the end, and allowing perpetual entrance and exit of air, it arrested all particles suspended in it, and the urine or other fluid which was the subject of experiment remained permanently unaltered. Or, again, the same object may be attained by having the mouth of the flask plugged with a mass of purified cotton-wool, which effectually filters of its dust the air that enters the vessel in consequence of the condensation which alternates with expansion in the diurnal changes of temperature. But if the neck of the flask is broken short in Pasteur's experiment, or the plug of cotton-wool removed, organisms are sure to show themselves before many days have passed. Even more striking is the method adopted by Mr. Lister, who decants the boiled organic liquids into wine-glasses purified by heat, and each covered with a glass cap similarly purified and a glass shade, scrupulous care being taken to avoid the entrance of dust during the process of decanting. Neither cap nor shade fits closely, so that a constant interchange takes place between the external air and that in the wine-glass, yet the double protection afforded by the cap and shade effectually excludes dust, and the result is, that although the organic liquids gradually diminish in bulk by evaporation, and in the course of months dry up altogether, no organisms make their appearance from first to last, nor does putrefaction or any other fermentative change occur. If, however, the glass shade and cap are removed for a few minutes and replaced,

fungi or bacteria soon show themselves. But he has found that if the glass cap be only lifted for a second or two in an ordinary apartment free from draughts there is practically no risk of the entrance of any organism in the short period of exposure.

Further, it has been shown by Pasteur and other observers that it is by no means essential to the success of such experiments that the organic liquids should be boiled, but that when circumstances admit of their being withdrawn uncontaminated from their natural receptacles, such as the urinary bladder, the bloodvessels, the udder of the cow, or the shell of a fresh-laid egg, they will remain free from organisms and from putrefaction when kept in pure vessels and protected from dust.

It has also been discovered that impure air will purify itself by mere subsidence of its dust. Pasteur long ago proved that putrescible fluids could be kept free from putrefaction in air taken from cellars free from draughts, when the solid particles of the atmosphere had had time to deposit themselves by subsidence; and Prof. Tyndall has recently subjected air purified by being kept at rest to very searching tests to ascertain if it will excite putrefaction in putrescible solutions. He has found that solutions of meat, cheese, turnip, &c., first subjected to a high temperature, can be kept free from putrefaction for an indefinite time exposed to the air-closed boxes that have been kept at rest a day or two, to allow the dust to subside, precautions being taken to prevent the said dust rising again by coating the inside of the box with glycerine. The same experimenter has demonstrated the fact that the air which has been thus rendered incapable of exciting putrefaction—i.e., aseptic—is also optically pure: that is, that there are no particles or motes to be detected in it when illuminated by a beam of electric light in a darkened room.

I think, then, we are justified in concluding that in the dust of the atmosphere there are such things as fermentative particles, organisms, germs, or whatever you like to call them, and that these, under favorable circumstances, induce putrefaction in fluids and solids capable of the process; that without these germs putrefaction and the formation of bacteria does not take place, and, finally, that these germs can be destroyed or removed from the atmosphere by the various means that I have above described.

Let me here remark, as having an important bearing upon Mr. Lister's practice, that in the case of those fluids that have been kept free from putrefaction by any of the above described means, the addition of the smallest drop of ordinary water, or the contact of a glass rod that has not been specially treated to render it aseptic, will almost certainly excite putrefaction, though all other prescribed conditions are scrupulously carried out to prevent its occurrence.

On the other hand, Mr. Lister has found that when any portion of apparatus used in investigations on this subject cannot conveniently be purified by heat, the object may be attained by washing the glass or other material with a strong watery solution of carbolic acid, and drying it with a carbolised rag, and in the course of a long series of experiments he has invariably found this antiseptic agent as efficacious as the flame of a spirit-lamp in preventing the growth of organisms and the occurrence of putrefaction.

Mr. Lister's object in the treatment of wounds

and abscesses is to exclude from them these germs or organisms that float in the atmosphere and are the causes of putrefaction, and the means he employs for effecting this purpose he recommends, not as the best that can be used, but as the best that he has been able up to the present time to devise; and although Mr. Lister considers the truth of his theory incontrovertible, yet he does not claim to have brought his practice to perfection.

Mr. Lister claims for his plan that when it can be carried out with due care and proper observance of details, he can, as a rule, secure that an open wound should heal after the manner of a subcutaneous injury—that is, without inflammation or constitutional fever, and for the most part without suppuration; while, if suppuration occurs, he secures that it shall not be putrefactive—that is, accompanied by the changes that we consider evidences of putrefaction, such as the formation of bacteria and the evolution of fetid gases.\*

In the treatment of abscesses by the antiseptic method, Mr. Lister believes that he has effected an entire revolution in the course of the disease after the cavity has been opened, and to this I will more particularly allude in my next lecture. But I may here mention that, along with many local advantages, the patient is said to be free from all danger of irritative fever as the immediate consequence, and from hectic at a later stage.

I said that these advantages are claimed for the antiseptic method when it can be carried out with due care and a proper observance of details—that is to say, in cases where the surgeon himself inflicts the wound on an unbroken skin; for in this case he can protect the part against the entrance of putrefactive ferments, whereas when sinuses have formed, or when a wound has been some time exposed to the air, abundant sources of putrefaction already exist in the wound or abscess; nor is there at present any means by which, under these conditions, they can with certainty be all destroyed. You can thus understand how it is that Mr. Lister considers himself sure of success where he applies his treatment to an abscess which he himself opens, or to a wound he has made, and that he would generally expect success when dealing with a recent compound fracture or wound into a joint; whereas he would scarcely be disappointed at a failure if he applied his treatment to a case where sinuses already existed, or where an open wound had long been exposed to the air.

I must state these things explicitly to you in justice to Mr. Lister, that you may judge fairly of the results of the antiseptic treatment, understanding what it cannot do, as well as knowing the advantages claimed for it by its author. It is also only just to Mr. Lister, and essential, in order to enable you to form a fair estimate of the results of his method, to remember that he is far from regarding putrefaction as the only cause of suppuration. On the contrary, he has long since pointed out that any antiseptic substance, such as carbolic acid, if applied continuously to the exposed tissues of a wound, stimulates them to granulation, and the granulations to the formation of pus, giving rise to what he has termed "antiseptic suppuration," due to the direct chemical stimulus of the antiseptic.

He has also expressed the belief that putrefaction acts in a precisely similar manner in causing suppuration, the products of putrefaction being acrid chemical substances; but that there is this all-important difference between the two cases—that the antiseptic acts only on the part to which it is applied, whereas putrefaction, being a fermentation, extends itself into all the recesses of a wound or abscess, where blood or sloughs, pus or serum, affords a nidus for the development of the bacteria. Further, Mr. Lister has directed attention to the important truth that suppuration, besides being brought about in this manner by the direct stimulus of chemical irritants, may be produced by ordinary inflammation without the access of any external disturbance, putrefactive or otherwise, as in the familiar case of an ordinary deep-seated abscess, the contents of which when evacuated are free from putrefaction. This ordinary inflammation he believes to be due to excited nervous action, and the commonest of all causes of it in surgical practice is tension, occasioned by blood or serum being pent up within the cavity of a wound; and he has insisted upon the fact that, in consequence of the irritating influence of the antiseptic material in the spray and sponges, the sanguineous discharge is greater in the earlier periods from a wound treated antiseptically than from one managed in the ordinary way. Hence it is doubly necessary to provide free escape for this serous effusion, which is done by means of drainage-tubes; and if these be neglected or inadequate, tension will inevitably result, with corresponding inflammation, and in due time suppuration. Lastly, we must bear in mind that inflammation caused in this manner by tension, like any other ordinary inflammation, will be attended in proportion to its intensity by constitutional disturbance or fever.

If, therefore, we see suppuration make its appearance, or inflammatory disturbance and febrile excitement, in any case treated antiseptically, we need not necessarily infer that the antiseptic method is at fault until we have seen if we can discover some cause, other than putrefactive, which may account for the phenomena.

It will be obvious to those of you who have followed me thus far, that though all that I have stated may be absolutely true in theory, and though Mr. Lister's practice may be thoroughly sound in a chemical sense, yet pathologically it may be unsound. I mean that the antiseptic treatment may succeed in preventing the occurrence of putrefaction and the development of bacteria in wounds and open abscesses, yet this freedom from putrefaction does not necessarily imply an absence of local inflammation and constitutional irritation. Now this is what I want you especially to observe for yourselves: first, if the secretions of wounds and abscesses treated antiseptically are free from putrefaction; and secondly, if, together with this absence of decomposition, you have an absence of local inflammation and constitutional fever—other sources of these conditions being excluded.

That you may judge of these things the better and more certainly, I use the antiseptic method to those cases which, under ordinary treatment, are specially liable to local manifestations of inflammation, and are generally the sources of well-marked constitutional disturbance. I have not used the plan in ordinary amputations, removals of the breast, tumours, operations for hernia, nor in the treatment of acute superficial abscesses, for

\* The local advantages, if secured in individual cases, must of course affect the general salubrity of a hospital. On this subject see *The Effect of the Antiseptic Treatment on the General Salubrity of Surgical Hospitals*, by J. Lister, F.R.S., *Brit. Med. Jour.*, 1875, vol. ii., p. 769.

in these the result of surgery in a healthy hospital is usually satisfactory; but in resections of large joints, in wounds of joints and compound fractures, in deep abscesses, and especially in chronic abscesses connected with joint disease or caries of bone.

In judging of the results of the antiseptic treatment in our hands, I must beg you to bear in mind the facts which were published by Prof. Tydall in January last. I must ask you to observe that even in the chemical laboratory there are difficulties to be overcome and minute details to be observed in order to obtain uniform results; and that, even in the hands of masters of the art, notwithstanding all care, sources of error will sometimes occur, and a fallacious result be obtained. Now, if this be the case under the circumstances I have referred to, how much more difficult must it be to carry out the necessary details when beginners like ourselves are dealing with the living tissues of the human body.

## Clinical Lecture

ON A

### CASE OF IMPACTED GALL-STONE, AND JAUNDICE CONTINUOUSLY FOR TWO YEARS AND A HALF.

*Delivered at the London Hospital,*

By J. S. RAMSKILI, M.D.,

Physician to, and Lecturer on Medicine at, the Hospital.

In many cases of jaundice the diagnosis is not difficult, and it may be confidently said that the morbid condition will most probably disappear in two or three weeks. Such is the case with so-called simple or catarrhal jaundice. In other cases the jaundice seems for a while catarrhal, but in the course of a few days or weeks symptoms set in which leave no doubt that the disease will prove fatal; whilst in some the jaundice continues for weeks or even months, and it is difficult to say what is the causal condition, and, not knowing the cause, it is impossible to indicate whether it will terminate in death or recovery. Easy, therefore, as it seems to be in many cases to make a diagnosis and prognosticate the end, in others it is unquestionably so difficult that the most experienced physicians cannot confidently come to any conclusion. And those, perhaps, who have seen most of clinical medicine are ready to admit that they have watched cases of jaundice for weeks or months, feeling confident that it was due to impacted gall-stone, and the post-mortem examination showed it was caused by a cancerous mass pressing on the common bile-duct, or *vice versa*. And although attacks of "biliary colic," followed by very temporary jaundice, are so characteristic that there is little or no difficulty in such cases in diagnosing the cause of the jaundice, yet in other cases the passing of a gall-stone is attended by very few symptoms, certainly no severe attack of pain nor urgent vomiting to attract attention. The jaundice is perhaps the symptom which leads the patient to

think he is not well, and requires medical attendance. And some of these obscure cases are sometimes very protracted, and consecutive complications arise which eventually kill. Such was the case with the patient I purpose now to bring under your notice. The particulars of his illness are very instructive; it will, therefore, be useful to give them rather fully.

The following particulars were given by the patient:—In his youth he was subject to epileptiform seizures; in his manhood he had no decided fits, but suffered much from giddiness. He seems to have had no symptom of hepatic disease till June, 1871; he then had severe irritation of the skin, and was advised to go into the country for change of air. He went to Yarmouth, and whilst there gradually became jaundiced; his urine became very dark, and his feces of a light color. He was, however, able to walk about as usual, but his appetite failed a good deal. He returned from Yarmouth and went to his work, but jaundice still continued; he had no pain, but he had "cold shivers," his teeth chattered, and he was in consequence obliged to leave his work, go home, and sit before the fire, even in the middle of summer; he had sometimes two of these attacks in a week. A few months after the commencement of these attacks he went to King's College Hospital, and attended there for four or five months, but his symptoms continued. During this time he continued his work, and except at the time of the rigors he never lay up in bed, and he most positively said the jaundice continued without a day's intermission about two years and a half. It is very rare to find jaundice continuing so long; we were therefore led to question the accuracy of his statement. We inquired of Dr. Davey, of Old Ford, who attended the patient at the time he had the jaundice, and had known him for years; he assured us he could testify to the truth of the patient's statement, and there was no doubt that he had jaundice for the time named, two and a half years. After this the jaundice subsided, but he did not feel well; how far, however, his suffering was dependent on hepatic disease, or to what extent on his epileptic state, was not clear. In May, 1874, he was attacked with severe pain in his abdomen and left side; this came on gradually, but it was continuous, and he was obliged, in consequence, to remain in bed a fortnight. He again became jaundiced, and as soon as he was able to get about he came to the London Hospital. He was seen by Dr. Stephen Mackenzie, and whilst under his treatment the jaundice a second time disappeared. After the last-named seizure, he quite recovered, and was well until five weeks before he was admitted into the hospital. His last and fatal seizure also set in with severe pain, as he said, at the pit of his stomach; it was very intense, and extended into the region of the liver also. The pain continued, but he was able to keep about for a while. He did not vomit, but he felt sick, and endeavored to excite vomiting by tickling his fauces. The pain increased, and he took chlorodyne, which relieved him. One day, whilst going home, he was attacked by shivering, which lasted an hour; he then lost his senses and became delirious. It would seem that after the rigor he had one of his accustomed epileptiform seizures. He was at this time attended by Dr. Davey, and subsequently sent to the London Hospital.

He attended at the out-patients' department on

Jan. 11th. He was then jaundiced, and stated, as already mentioned, that the attacks set in with pain, without vomiting, and four days after the commencement of the pain, and not till then, he a third time became jaundiced. On examining his abdomen, a mass was felt coming down from under the right ribs, occupying the right half of the epigastrium.

He was admitted into the hospital, and he was then noticed to be much jaundiced. He had no pain, no vomiting; but he said he had lost much flesh—nearly three stone. In the night of the day of admission he had a rigor, which lasted about twenty minutes he perspired a good deal after it, and during the reaction he was delirious. Next day, the left lobe of the liver was felt distinctly, extending about two inches below the left ribs; its surface seemed smooth, its edge was appreciable but not sharply defined, and it descended during inspiration. Stretching across the epigastrium a smooth solid mass was felt; it seemed to extend up under the right ribs, and its edge was felt about three inches below the ribs; it descended markedly during inspiration. On percussion, the liver dullness appeared to reach as high as the third right costal interspace, and behind as high as the angle of the left scapula; on taking a deep breath this liver dullness was lowered, clearly indicating that there was no pleuritic effusion. Below the edge of the right lobe of liver there was an ill-defined soft substance, and it was thought that this might be the gall-bladder. His urine was deeply bile-stained, but contained no albumen.

A week after admission the patient complained of nausea; he had no severe pain, but a gnawing sensation in his abdomen; his faeces seemed to contain some bile, they were not very white. He had not had any return of the rigor. But on Jan. 20th the jaundice and enlargement of the liver persisted, and he was this day again seized with a rigor; he complained of pain in his abdomen, which was tympanitic. His temperature was normal before the rigor, afterwards it was 103°. On the 22nd he had another and severe rigor. On the 24th the mass in the region of the liver was carefully examined: its surface was smooth and firm; in no part of it could any soft elastic substance be felt to indicate suppuration. It was particularly noticed during this examination that even firm pressure did not cause pain, and even free movement of the abdomen did not distress him, which seemed to indicate there was no peri-hepatic peritonitis. The jaundice continued much the same, but his expression had altered considerably, and he had evidently lost a good deal of flesh. It was then found that his temperature every night rose to 101°, 102°, or 103°, even when he had no rigor. His tongue was parched and brown, his pulse quick; and although his temperature in a morning fell sometimes to 99°, the nightly exacerbation showed clearly that some acute change was going on. The absence of pain and tenderness in the region of the liver seemed to be evidence there was no acute inflammatory change in this part. Physical signs showed no acute change in lungs or heart, there were no signs of intracranial inflammatory action, nor of nephritis or other local change, giving rise to this pyrexia and other great constitutional disturbance; it was therefore inferred by a process of exclusion that there was some suppurative inflammation probably in or about the liver, although, as already said, the absence of

pain and tenderness seemed somewhat opposed to that opinion. It was suggested that the rigor might be due to malaria, but the nightly rise of temperature seemed to negative that view. He remained in much the same state during the next two days, but on the 26th again had a rigor. His urine all this time was deeply bile-stained; his faeces were examined, and, although light in color, they were not very pale like bileless evacuations. On the 29th he was suddenly seized with a peculiar sensation in his stomach, and he brought up about six ounces of coagulated blood; next day he had a great deal of pain in the epigastrium, and he retched; his tongue was very dry and brown. On the 31st he again had a shivering fit; he became very prostrate, and died.

The autopsy was conducted by Dr. Sutton. Whilst the body was lying on the table, and before the abdominal wall was cut into, a mass was felt about four inches below the sternum; its surface was smooth, and its edge rounded off; but it was noticed that whilst tracing the edge towards the right, it curved upwards, and ascended an inch or two. Passing from this indentation still further towards the right, the edge of the liver was very distinctly felt. The abdominal veins were not enlarged. On opening the abdomen, very little serum escaped; the peritoneum was healthy. The liver was seen much enlarged, extending three or four inches below the ribs, and it filled the epigastric region; its left lobe was also much enlarged. The spleen was lying back towards the left kidney, and its edge was an inch or two below the ribs. The depression above named was caused by the lower margin of the right lobe being indented and puckered, forming a notch, to which was adherent a portion of the omentum. This indentation was about midway between the median line and the lateral boundary of the abdomen. The stomach was lying immediately under the liver, and was distended. On separating the adhesions attached to the notch just named, cutting through the lesser omentum, then drawing down the transverse colon, and lifting up the stomach, some pus was seen escaping. The duodenum was next opened; it contained bile; and, whilst searching for the orifice of the common bile-duct, a large canal was found opening into the duodenum. This canal contained a quantity of pus, and had a distinct lining membrane; it was traced up into the substance of the liver, and communicated with the duodenum by an orifice which admitted a good-sized catheter. Above it was much wider. In this canal, about an inch from the duodenal end, a large gall-stone was seen, of a greyish-yellow color, embedded in a cavity. It was lying across the canal. The cavity in which the stone was embedded was evidently not of recent origin; its wall was smooth, and its edges rounded off. The gall-bladder was searched for with great care; but could not be found. Whilst doing this it was observed that there seemed to be another gall-stone projecting into this cavity, and extending across into the substance of the liver. On removing what seemed to be the second stone, a duct was seen above the large canal already named. On passing a probe down this duct and cutting it open, it was found that it ended by a small orifice in the duodenum, and it continued upwards into the canal, but above the gall-stone. This duct, which was lined by mucous membrane, bile-stained, was the lowest portion of the ductus communis-choledochus. It contained a

few small, dark, seemingly recently formed gall-stones at its duodenal end. It was then seen that not only did this large gall-stone, which had probably been broken into two, occupy the cavity above mentioned, and extend across the canal, but it projected into the common duct, and it seemed that the cavity and a portion of the canal were formed by altered gall-bladder. It appeared most probable that there had been a large stone in the gall-bladder, which had set up ulceration in its lining membrane; the lower portion of the bladder had then become adherent to the common bile-duct, and the gall-stone had penetrated from the gall-bladder into the common duct. The walls of the cavity and large canal were covered with pus, and the bile-ducts in the liver above the impacted gall-stone were much dilated and coated with pus. It further seemed that the summit of the gall-bladder had become adherent to the duodenum also, and a communication established between them, forming the large orifice already mentioned, opening into the duodenum. The liver was found studded with abscesses, which were evidently recent, for their walls were soft, and they had only a soft, thin lining membrane. Some of the abscesses were about the size of a walnut, others much smaller, and the dilated, pigmented, pus-coated bile-ducts were traced opening into some of these abscesses. The liver-substance generally was much softened. The remainder of the body presented no change which need now occupy our attention.

Judging from the smooth lining membrane, and the distinct fibrous tissue around the cavity, it seemed that the stone had been impacted for a considerable time. As already stated, it projected into the ductus communis choledochus, but did not completely close its canal; there was room for bile to pass by the stone down the common duct. The lining membrane of the duct was found bile-stained, and there was bile in the duodenum, and seemingly in the faeces, all showing that bile was able to escape to some extent from the liver. Considering the appearance of the abscesses, the suppurative inflammation would seem to have set in during the last few weeks of life; the ducts above the gall-stone had probably been slowly dilated by the pressure of the accumulating bile, but for a while sufficient bile escaped to prevent jaundice. It would seem, however, that the suppurative inflammation increased, and extended up the ducts into the substance of the liver, and the escape of bile was still further obstructed by the accumulation of pus. The liver then became enlarged, the retained bile absorbed; hence the second attack of jaundice which set in, as we stated, five weeks before the patient's admission into the hospital. And the symptoms would seem to show that the suppurative inflammation began at the time he was seized with severe pain in the epigastrium and right hypochondrium, for his severe rigors, which continued up to death, followed shortly on that severe pain; and that the suppurative inflammation was set up by the gall-stone was shown by the fact that the puriform change existed in greatest abundance from the gall-stone into the substance of the liver. During life, whilst considering the probable cause of his primary attack of jaundice, we could not help but point out that the patient seemed to have had no symptoms of "biliary colic," nor severe pain, nor vomiting at the onset of the jaundice, which seemed to indicate that the long-con-

tinued jaundice was not caused by a stone which had descended and become arrested and impacted in the common bile-duct. If our inferences from the post-mortem appearances be correct, it is not difficult to explain why he had no "biliary colic," for the reason that no stone passed down the duct, but, as already said, it made its way from the gall-bladder direct into the common duct.

## ABSTRACT

OF THE

## Croonian Lectures

ON THE

## PATHOLOGY AND RELATIONS OF ALBUMINURIA.

By W. HOWSHIP DICKINSON, M.D., F.R.C.P.,

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### LECTURE I.

I propose to bring under consideration some of the larger facts which are connected with the several forms of renal disease characterised by an albuminous state of the urine, marking their pathological distinctions, tracing their points of mutual relationship, and touching upon their associations with organic changes external to the kidney, or more or less widely distributed through the economy.

The organic conditions of persistent albuminuria may be broadly divided into three:—

First, *nephritis, tubal or diffuse*, the product of simple inflammation of the secreting structures. This, though essentially tubal, may, if intense or long-continued, involve the interstitial tissue in the inflammatory process, and supply the granular kidney with one mode of origin.

Secondly, the *granular kidney*, or the *kidney of chronic interstitial hypertrophy*, usually beginning as an independent change, but possibly a sequel of the more acute disorder.

Thirdly, the *lardaceous kidney*, a condition in which this gland participates only in an infiltration common to many organs and tissues of a material different from any of the normal constituents of the body.

The first begins with changes local to the kidney, but often ends in results general to the arterial system; the second is so constantly associated with arterial changes that it is disputed whether the renal and the arterial are cause and effect or are simultaneous results of circumstances antecedent to both; the third begins, without question, systematically, producing renal disease as only one of a series of secondary organic changes. Each of these conditions has its points of contact with the others. Nephritis at first tubal may end intertubally, and thus, however rarely, the large smooth kidney become small and granular. The granular kidney, or the kidney of interstitial fibrosis, though usually of independent origin, may take its rise in either of the other forms of change. And the

lardaceous state, to complete the complicated relationship, may set up renal inflammation, whether of the tubes or of the interstitial tissue.

I will touch in brief and general terms upon the origin, nature, and connexions of each disorder.

*Tubal or diffuse nephritis*—for tubal nephritis so often begins diffusely, or becomes diffuse, that no more definite separation can be made between them than between slight and severe—is a catarrhal exasperation of the secreting function, due to some excessive or unsuited stimulus. Mere tubal catarrh, with attendant obstruction and congestion, is happily, in a large majority of cases, the only organic change; but when the process is intense or persistent, it is apt to cause in the interstitial tissue a delicate hypernucleation which, in its early stages, may easily escape notice, but may lead in the end to fibroid thickening. The smooth, swollen kidney, white or red, as blood or epithelium predominate, may acquire in the end a granular inequality of surface, should the interstitial tissue become involved and time be given for consequent changes. It may be laid down as an axiom in renal pathology that granulation invariably implies fibrosis. No mere tubal condition, whether of distension or collapse, breaks the superficial level.

Thus, according to date and intensity, the following outline may be drawn of the phases of renal inflammation:—

1. *The congested kidney*.—The blood-dripping kidney of acute congestive nephritis.

2. *The large white kidney*.—Swollen and pale, either absolutely smooth or but sparsely dimpled; dependent upon nephritis mainly, and from the first tubal, but which may have come to involve the intertubal tissue. Superficial depressions, if they exist, are a sign that it has become thus complicated.

3. *The contracting kidney of nephritis*.—Granulating and fibroid like the granular kidney of latent origin; not often thus ensuing upon acute inflammation, but to be recognised as a rare and late result.

The intimate mechanism of these changes may be briefly reverted to. The first noticeable changes are an excessive production of epithelium and an excessive influx of blood; the epithelium cemented into cohesion by the fibrine which escapes from the overloaded vessels. The congestive type is well marked, and often rapidly fatal. It may be attended with swelling so great and so sudden that the capsule of the kidney may actually burst and bleeding take place into the areolar tissue of the loins. In this intensely congestive form scattered spots of nucleation may be found, perhaps not uniformly, but sometimes abundantly, in the interstitial tissues both of cones and cortex. And in the slower form, which is marked by the large white kidney, similar germs of interstitial fibrosis may be detected in severe or protracted cases. Morbid change to be simple must generally be recent; not that all recent disease is necessarily simple. When nephritis is protracted, and even sometimes when of recent origin, the nuclei of the interstitial tissue swell and multiply; they become numerous and conspicuous in each of the once pellucid bars by which the secreting elements are separated, and may even occupy so much of the section as to exclude nearly everything else from view. This helps to give its extravagant bulk to the white kidney of old date, and to render return

to health impossible. I have not dwelt upon the tubal changes which are essential to the disease, and are the main cause of its symptoms. The epithelial accumulation and its frequent fatty change under the inflammatory process are well known. The catarrhal change is first to come and may be first to go. The nucleation may outlast the catarrh and remain when the tubes have for the most part recovered themselves, as the only prominent change. Usually the two persist together, and with tubal distension and intertubal nucleation, much increase of bulk, and a still smooth surface, the large white kidney finds its close.

More rarely, time is given for the nuclei to develop into fibre, the fibre to contract, and the surface to granulate. In answer to the question, how long it takes the once smooth kidney of nephritis to become granular? I may refer to the case of a boy who died at the age of eleven with this state of kidney, as the result, apparently, of scarlatina three years before; with a girl who died of the same disorder at the age of twenty-one, it was traced with equal probability to scarlatina eleven years before; and probably in most cases in which the course of nephritis can be counted by years more or less interstitial fibrosis, and its result in superficial granulation, can be detected.

Passing from the kidney itself to the changes consequent upon its disturbance in other organs and tissues, affections of the inflammatory sort, chiefly such as concern the respiratory organs, are the most frequent and the most fatal in childhood; while the dropsical and uræmic results of the disease are the most mischievous in later life. In the next place, it is of interest to inquire whether any secondary arterial or cardiac affection can be recognised in connexion with this inflammatory form of renal disease, since the answer may throw light upon the disputed origin of the cardio-vascular changes which are so common with the granular kidney.

I have examined somewhat carefully into the state of the arteries and of the kidneys in as many well-marked cases of inflammatory disease as recent opportunities have allowed. The results are displayed in a table [which gave the particulars of five cases of acute renal dropsy, all in young and previously healthy subjects; four were children varying in age from six to thirteen, the fifth a girl of nineteen; the duration of the disorder varied from ten weeks to as many months]. In all, the arterioles were thickened and the heart hypertrophied. In each case the arterioles were carefully compared with those of health and of the same time of life, prepared in precisely the same manner, many different methods being used. As to the result, there was no doubt the thickening involved both muscular and fibroid coats, though neither to the extent found with the granular kidney. [Diagrams, made with the camera lucida, showing the exact relative thicknesses of the morbid as compared with healthy arteries, were exhibited.] Degenerative changes, especially in the nuclei, were noticed in some of the cases. A conclusion of great importance is forced upon us by the facts: that under the influence of renal disease of inflammatory origin in previously healthy subjects the arteries undergo changes similar in kind to those which accompany the granular kidney, however small in degree. But while these changes certainly ensue upon disease at first local to the kidneys, it is not so easy to assert that

they occur independently of renal fibrosis, since some degree of incipient fibrosis or nucleation is generally to be found in the kidney where the disease has lasted long enough to set up the cardio-vascular change. But consider the youth and previous health of the subjects, and the inflammatory nature of the attack in each instance, it is quite clear that both the fibrosis and the arterial thickening were results of the local glandular disturbance, not parts of a general deterioration.

With these arterial and cardiac changes are to be noted an increase of arterial tension as appreciated with the sphygmograph, and occasionally its retinal results in hæmorrhages and white spots.

Thus, to conclude a crucial part of a debated question—vascular tension, cardiac hypertrophy, arterial thickening, and retinal hæmorrhage, are all to be found with, and are presumably caused by, disease beginning locally to the kidney as the result of inflammation.

To pass now to the more chronic disease, which is recognised by the granular kidney, and caused by creeping fibrosis, we have to describe a condition which begins with and belongs essentially to the connective and vascular structures. The change begins in a disproportioned growth, somewhat of a rank luxuriance, in the fibroid tissue with which the arterial channels are uniformly fringed. Hypertrophy of this part leads to atrophy of the rest, creeping along the arterial lines with slow and hesitating steps, involving the organ not all at once, but by little and little; the disease makes itself felt so gradually that its date is usually indeterminable, and in other respects, too, it affords a precise contrast to the more acute disorder.

The organic derangement is declared pathologically by the superficial loss of level, to which the term granulation is applied. This condition is only produced by a drawing-in of the surface at certain points by a contractile growth, the distribution of which is determined by that of the blood-vessels around which it begins. The essence of the disease as it first takes substance and shape is a multiplication of nuclei, with subsequent fibrillation in the interstitial tissue. Spreading inwards along the arteries, surrounding concentrically the Malpighian bodies, imbedding, compressing, and strangulating the tubes in its path, while others for a time escape only to yield to its later encroachment, the growth overruns the gland after the manner of the invader who likened his scheme to the eating of an artichoke leaf by leaf. The new growth is different in its rich nucleation from the original fibrous tissue of the organ. It occurs sometimes in great masses, and develops capillary bloodvessels within itself. [These particulars were demonstrated from diagrams.]

To touch upon the changes which ensue in the gland upon its occupation by this growing and contracting material, they are due in part to its bulky presence, and in part to its constricting action; the former are best seen in the rare granular kidney of childhood, the latter in the more chronic form which belongs to advancing life. The tubes are variously distorted parcelled by the fibroid tissue into insular groups, cut up into cysts and compressed to impenetrable threads. The epithelium suffers little; late in the disease it is variously distorted by pressure.

Besides the slow and gradual accession which is the rule of the disease, it is to be distinctly recognised that the disorder may be an immediate though

slowly declared sequence of acute nephritis. The general interstitial nucleation which may be left by the inflammatory process may grow into fibre, and the fibre contract until at last the granular kidney results. This origin, however, of the granular kidney is exceedingly rare.

Passing to the cardio-vascular changes which accompany the granular kidney, hypertrophy of the heart, though not invariably present with it, is so frequently so as to be a most valuable clinical diagnostic of the renal condition. With regard to the arteries, these broad modifications are to be recognised as contributing in different proportions to their change—first, a thickening with alteration of texture of the muscular coat; secondly, a thickening of the fibrous coat; thirdly, a degeneration which chiefly affects the muscular coat, but may in the end supersede every other morbid process, and replace all distinction of coat by a mere confusion of granules and fat. [These changes were illustrated by diagrams, and explained in further detail.] The thickening of the outer coat is not to be attributed to the action of reagents, since it can be displayed with any. The hypertrophy of the fibrous coat is a real pathological change, and that of the muscular not less so. It seems that the muscular hypertrophy often appears earlier than the fibroid. The ultimate degenerative changes, which chiefly belong to the muscular, are the chief agents in causing the brittleness of vessel to which the hæmorrhagic proclivities of the disease are so largely due.

As with the kidney of nephritis, but more markedly with the disease now under consideration, these changes in the circulating system are attended with an increase of arterial tension, a concurrence which has recently been fully treated of in this room by Dr. Sibson.

## Original Papers.

### CASE OF FRACTURE OF SPINE, WITH CONSIDERABLE DISPLACEMENT; LIMITED RECOVERY.

WITH REMARKS.

By JOHN GAY, F.R.C.S.,

Senior Surgeon to the Great Northern Hospital, etc.

(From Notes by Mr. CARTER, House-Surgeon.)

J. A—, aged twenty-three, a bricklayer, fell on his back from a tree, a height of about fifteen feet it was said, at 8 A.M. on May 30th, 1875. He was taken at once to the Great Northern Hospital. He had sustained a fracture of the spinal column at the site of the eighth dorsal vertebra, with considerable overlapping backwards of the upper fragment. He was stunned at the time of the injury, but was recovering consciousness when he reached the hospital. There were complete loss of sensation and motion in the lower limbs, and in the trunk below a well-defined line, which extended around the body, with slight lateral curves downwards, from a point a little above the umbilicus;



paralysis of bladder and rectum, slight priapism, urgent dyspnoea, with almost entire suspension of costal movements, difficult articulation, and ptosis. The pupils were contracted, but not insensible. Pulse 90; and temperature in axilla  $100^{\circ}\text{F.}$ , in rectum  $99.8^{\circ}$ . Was sick about three hours after admission. He suffered intense pain, extending from the line just indicated, upwards for some short distance over the lower ribs, with a sense of abdominal constriction. At 3 P.M. the pulse had risen to 116.

The cord had evidently sustained a severe and probably permanent injury; indeed, the aspect of the case was at this time such as to forbid any expectation that life would be prolonged beyond a very few days. He was placed on an unyielding couch, and as much weight as he could bear with comfort was appended to the trunk by means of well-padded straps around the loins. His urine was drawn.

His first night was very restless, with delirium and occasional efforts to be violent. With morning he became more tranquil, and his breathing less difficult. The pain around the lower part of the chest and, as he called it, "in his stomach," was still so severe that, fomentations and opium having failed to relieve it, large and repeated doses of chloral were given him.

June 1st.—A more quiet night. Pulse 120; temperature at feet and axilla,  $101^{\circ}$ ; skin hot and dry.

3rd.—Is fairly quiet, but still more or less under the influence of chloral. Temperature continues to rise, and at 10 P.M. was, in axilla,  $102.2^{\circ}$ ; at soles of feet,  $103^{\circ}$ . Ptosis had passed away.

7th.—Has begun to get rest without chloral. Pulse has fallen to 85, and temperature everywhere by one degree. Tongue furred; no action of bowels; signs of bedsores. Placed on a water-bed, a padded splint being applied to the spinal column.

8th.—Two enemata, and a third by a long tube, were returned without force or faecal matter. Temperature reduced by another degree; pulse 92. Tongue still coated; abdomen flaccid; some appetite for solid food. Slept without chloral last night.

9th.—Urine has been regularly drawn. Temperature, in axilla,  $98.4^{\circ}$ ; rectum,  $100.2^{\circ}$ ; right foot,  $99^{\circ}$ ; left foot,  $98.4^{\circ}$ . Bowels have acted three times unconsciously within the last thirty-six hours.

By the 15th his more distressing symptoms had much subsided; and he had become cheerful. The extension had given him much comfort, and apparently had somewhat reduced the spinal irregularity; but it had to be given up, as signs of ulceration were beginning to show themselves in the palsied tissues, beneath the straps. Still it had probably accomplished all that could be expected from it. The urine had become ammoniacal, and the bladder was consequently washed out with a solution of Condry's fluid. The voltaic current was to-day applied to the limbs; but although without direct result, some sensation, as that of burning, was felt in the soles of his feet on its suspension, which lasted three or four hours.

On the morning of the 17th, after a fairly good night, he complained of pain in the shoulder-joint. Pyæmia was feared, but the pain yielded to hot applications. The use of the battery was to-day followed by the "burning sensations," which had

extended to his toes, and which, as before, lasted three or four hours.

19th.—The pain in the shoulder has spread to the region of the cervical spine, and he has had some shivering, with headache, furred tongue, and pyrexia. Pulse 104; some lancinating pains in the legs.

24th.—The feverish symptoms have subsided, and to-day he has a sense as of "pins and needles" in his legs, as well as of passing his urine along the front portion of his urethra during micturition.

On the 25th, mucus and phosphates appeared in the urine; bladder washed out twice daily with a solution of sulphurous acid (1 to 16).

27th.—After the battery to-day he said he "felt as if he had legs again."

28th.—The urethra just sensibly gripped the catheter on withdrawing it, and the bladder admits a smaller quantity of injection and returns it with some slight evidence of muscular contraction. Urine improved.

29th.—Had a rigor last night, which lasted half an hour. Temperature, after fits, in axilla  $103.5^{\circ}$ ; pulse 112. Another, on the 30th, with lividity of face and dry skin, which lasted three hours, and was followed by profuse perspiration. Temperature during fit  $99.5^{\circ}$ ; afterwards, in axilla,  $103.2^{\circ}$ ; in rectum  $104.5^{\circ}$ , and at soles of feet  $101^{\circ}$ .

July 1st.—Frequent shiverings, especially on exposure. A large bulla formed along the right tendo Achillis, and some œdema on the dorsal aspect of left foot. He also spat a small quantity of blood. Urine: specific gravity 1015. The injection has been suspended for forty-eight hours, with the effect of the urine becoming more alkaline and turbid, and less power of retention.

4th.—Much improved. The shiverings have passed off; legs painful. The battery gave him pain along the course of the sciatic nerve. His bladder has gradually become incontinent.

On the 10th, another exacerbation took place. He had severe rigor, and his urine became more turbid; was very restless, and complained of throbbing pain in the seat of fracture. Pulse and temperature again rose.

By the 16th these symptoms had again subsided.

17th.—The battery produces burning pains in his toes, but has no effect whatever on his muscles.

21st.—Urine again clear and slightly acid. For the last two days has had *partial* priapism, to-day it is *complete*; signs of returning sensation in different parts. The applications to his bedsores are distinctly felt, and the tinglings have extended to his feet.

28th.—Began to have some control over his bladder; still the urine in great measure runs away.

August 3rd.—Another severe rigor, but without any untoward sequences.

9th.—Is much recovered in health, and begins to sit up.

15th.—Muscles of the legs, especially of the left, responded slightly to the voltaic current; particularly the peronei, the extensors of the great toe, and the solei. This result continued daily, but with varying results both as to the sets of muscles affected and the amount of contractile force.

27th.—Rigors have occurred from time to time since last date, with about the same local variation of temperature as on their former occurrence, but everywhere about a degree lower. The sores, which have been healing, look angry, and have

bled spontaneously on several occasions. Some pyrexia has set in, with headache and pains in the back and neck; pulse 110. A sore has appeared on the right knee. The urine has again become alkaline and ropy, and his bladder incontinent.

He had partially recovered from this relapse, when, on the 21st, 23rd, and 28th September, he had recurrence of rigors, succeeded, on the 29th, by another exacerbation of four days, followed by another and partial recovery. On the 24th October he had a still more severe return of the rigors and pyrexia; the pulse rose to 130, the temperature to 103.5°; the pain in the back recurred and extended to his shoulder-joint, aggravated by difficult and chiefly costal breathing; the battery ceased to occasion pains in the legs; and he had involuntary and painful stiffening of the fourth and fifth digits of the right hand. By the 29th these symptoms had again passed away with an attack of diarrhoea, of which he was conscious, and a return of sensation and muscular reaction to voltaic current in the thighs and legs; temperature reduced to 99.8°.

From this date the patient gradually mended, and on the 18th November his condition was nearly as follows:—Perfect union, at all events fixation, has taken place of the column at the seat of fracture, with overlapping to the extent of from a third to half an inch. The patient gets up, and has considerable mobility of his trunk. The line of demarcation between the palsied and healthy portions still exists. He has occasional twitching and tingling sensations in the limbs and palsied portion of trunk, always increased by passing the hand briskly over them or over the lower ribs. He has not, however, the slightest voluntary power over them, and but very little over the bladder and rectum. He moves about the ward by means of crutches or the articles of furniture, dragging his limbs after him. He can turn over when in a recumbent position, but only by a violent jerk of the healthy muscles of the trunk. When lying his limbs gravitate according to the movements of the trunk. His urine is clear and slightly acid. The battery gives uneasiness and slight muscular twitchings whenever applied. He looks remarkably well, is cheerful, and well nourished, and he has the full use of his mental faculties, organs of special sense, and all parts supplied with nerves above the seat of fracture. He left the hospital at the end of November.

This is only an uncommon case inasmuch as perhaps it is one of recovery (as far as these cases ordinarily recover) after a severe fracture at a part of the cord bordering on especially dangerous regions, and with an unusual amount of permanent displacement, involving, of course, grave cordal lesion. Mr. Hutchinson has recorded several similar cases of great interest in the London Hospital Reports, to which I can now only make a passing reference.

The first question that suggests itself is this:—Should efforts have been made to reduce the fracture at the time of its occurrence? The dyspnoea, with total paralysis of the abdominal and lower intercostal muscles, and the general condition of the patient, rendered anaesthesia questionably safe, whilst his intense agony seemed to forbid any treatment which must have intensified it. At the same time the overlapping of the fragments and the nature of the symptoms rendered it pretty clear

that the cord and its membranes, had suffered a considerable amount of physical injury.

Had the patient's general condition justified the expectation of ultimate survival, an attempt at reduction might have been seriously entertained, but the suggestion would have been met with a grave and reasonable doubt whether any effort in that direction would have even partially succeeded; and even if it had, whether the man's condition would have been in any respect the better for it.

There had been laceration of the cord and its envelopes to an appreciable extent, with persistent pressure, and had this been withdrawn it is questionable whether, on the one hand, the force necessary to bring the fragments into even approximate apposition would not have aggravated the lesion, and on the other, whether, supposing it could have been accomplished, and even without such additional complication, it would have lessened the gravity of the symptoms. Clearly, if with fracture and dislocation compression is alone indicated—and I am not sure that the diagnosis cannot be satisfactorily established—reduction should, if possible, be effected. I would remark, in passing, that this case, like another of spinal injury which I have recorded (see *THE LANCET* for March) is a protest against adopting those hystero-emotional complaints of a purely subjective character, which so often succeed “shakes” in railway collisions, as the legitimate results as well as proofs of nerve injury. They may *possibly* follow, but after *real* cord-lesions their occurrence is, I believe, very exceptional; and they can neither mask nor supplant that sure and unerring testimony to such injury, both as regards its nature and seat, which its objective features, in the way of certain disturbances of nerve-function, must inevitably supply. They are usually contemporaneous in their origin with that stage of convalescence after a slight injury when the patient ought to “put his shoulder to the wheel,” and, in spite of some natural sense of infirmity, turn gradually to his ordinary duties. If he does not, he becomes *un malade imaginaire* and “defendants” are victims. Such anomalous symptoms are said to have followed a slight railway disaster in some hundreds of cases which I have recently seen, but are not met with after other injuries. Mr. Erichsen says: “During a hospital practice of thirty years I can scarcely recall to mind a single case in which this state”—the emotional or hysterical—“has been met with after, or in consequence of, any of the ordinary accidents of civil life.”\*

It is interesting to observe and mark the progressive and distinct phases in the symptoms of nerve injury in the case, and see how closely they observe the ascertained laws which rule the cerebro-spinal functions.

But in order to their just appreciation, they must, I submit, be studied under three distinct classes, as I have before remarked,—namely, those of—1st, shock; 2nd, injury; 3rd, repair; and, although anomalous, I hold it to be no less true that the danger attending the processes of repair is always greater than that which is sustained by the injury. By “shock” I mean both that general and those especial functional disturbances which occur simultaneously with the receipt of the injury, and are due to some actual but transient disturbance of

\* Concussion of the Spine.

the nerve system, in contradistinction to those which are associated with the local and more severe lesions. It is well known that if the cranial contents of a frog, short of the pons, be suddenly destroyed, to all outward appearance the animal is dead; but it is not dead, and the indications of life gradually show themselves in the restoration of all those functions that are connected with the spinal system. The shock *per se*, most intense on the infliction of the injury, uniformly lessens in intensity until it has entirely passed away.

In the present instance the unconsciousness, ptosis, pain, dyspnoea, priapism constituted the indications of shock as well from transient disturbance of certain portions of the brain as of the cord. All these, intense at first, gradually cleared off, leaving those in relief which belonged especially to the physical injury done to the cord and its membranes—those of the second class. Although some (a very slight portion) of these were likewise transient, they were only so through the aptitude on the part of some of the injured tissues for repair.

I come now to those belonging to the third class—those attendant on the processes of repair. These will declare themselves, and, unlike the former, will intensify in proportion to the extent and kind of mischief to be repaired. These consisted in simple and pure paralysis of all parts supplied or associated with nerves below the seat of injury.

On the fourth day after the accident the temperature rose; on the seventh there were signs of bedsores, and on the fifteenth urinary complications. To these succeeded signs of the advent of those processes of repair which issued eventually in recovery, with some, but very slight, restitution of the nerve-power which was presumed to have been lost. The repair included, of course, that of the physical injury done to the neural, membranous, ligamentous, and osseous textures, and occupied a period equivalent to that for the repair of not merely an ordinary but an unreduced fracture—taking this as the longest process,—and was accompanied by all the phases of disturbed nerve function and constitutional powers contingent upon the separate local changes in the several textures which were essential to that result. The clinical history comprehended that of every restorative unit and step in the general sum of the entire process.

At first all connexion between the portions of cord above and below the seat of fracture seemed to have ceased, but after-events showed that this was not entirely the case.

Then the exacerbations which occurred from time to time—viz., on the 17th and 29th of June, on the 10th of July, on the 3rd and 27th of August, on the 21st September, and, finally, on the 24th of October—with rigors, temporary exaltation of heat, and an ebb in the tide towards recovery of varying severity, showed distinctly local changes of an inflammatory and perhaps suppurative nature, which were restorative—although really more threatening, as far as life was concerned, than those which attended the infliction of the injury,—for they culminated in, as they tended towards, that result.

Looking at these injuries by this light, it becomes obvious that of the three stages, the third, or that of repair, demands very close consideration in a therapeutical point of view.

A physical injury has been sustained by an important organ, an organ in which any or the slightest organic change in its histological elements, by whatever process, is attended with the gravest impairment of its functions, as well as of others necessary to life. In the treatment, then, the object to be kept in view is repair of the injured textures with the least amount of adventitious material. All action that is superfluous or not actually wanted for that result, as tending to permanent thickening, interstitial effusion, softening, and so forth, should be anxiously looked for, and, if possible, counteracted. To this end local exaggerated action of an inflammatory kind should be subdued, the functions of excretion and assimilation should be kept as far as possible in a state of perfectly healthy exercise, and rest of mind and body, with every other favoring influence, should be most carefully brought into curative co-operation.

## ON GELSEMINUM SEMPERVIRENS.

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and

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(Continued from April No., p. 168.)

### THE INFLUENCE OF GELSEMINUM ON RESPIRATION.

IN the experimental investigation of a drug it is often advantageous, and sometimes even absolutely necessary, to depart from a strictly logical order of procedure. In our last paper we described the effects of gelseminum on the frog's heart, and it was our original intention to have spoken in the present communication of its influence on the circulatory system of mammalia. Gelseminum, however, exerts so powerful an influence on the functions of respiration, and is so pre-eminently a respiratory poison, that a description of its action on the heart of warm-blooded animals would be almost unintelligible without a previous consideration of its influence on respiration.

We have less hesitation in departing from the orthodox order, as by so doing we are afforded an early opportunity of insisting upon a point of some practical importance. From our experiments upon reflex action it might have been supposed that the drug was indicated and would be advantageously administered in diseases such as tetanus, which are characterised by a condition of morbid excitability of the cord. We should hesitate to adopt such a mode of treatment, believing as we do that a dose sufficiently large to exert a beneficial effect upon the cord could not be administered without implicating the respiratory apparatus to such an extent as to endanger the patient's life. In illustration of the correctness of this view we may refer to a case of traumatic tetanus treated by gelseminum at the Charity Hospital in New York.\* The case is

\* New York Medical Journal, 1875, p. 512.

very imperfectly reported, but it would appear that the liquid extract of gelseminum was given every three or four hours in doses of from twenty to thirty minims. After the first dose the muscles became relaxed, and on the following morning respiration was affected to such an extent that the patient became cyanotic, and shortly afterwards died. Death may certainly have resulted from a tetanic condition of the muscles of respiration, but the impression conveyed by the report is that the result was due rather to the treatment than to the disease.

The powerful influence exerted by gelseminum on respiration has not failed to attract the attention of previous observers. In nearly all the recorded cases of poisoning by preparations of this drug, the affection of respiration has been a prominent feature. Thus, in a man aged twenty-four, whose case is reported by Dr. Boutelle,\* and of which we hope to speak in detail on a future occasion, two one-drachm doses of the liquid extract reduced the respiration in three hours to three or four in a minute. In the lower animals the affection of respiration has been observed by Dr. Bartholomew,† by Dr. Ott,‡ and by Dr. Berger,§ of whose statements our experiments are in the main confirmatory.

We now proceed to speak of the effects of gelseminum on the respiration of frogs. Our observations on this point have been numerous, we having utilised for this purpose many of the animals with which we investigated the action of the drug on the nervous system. Our mode of procedure was extremely simple. We usually injected the drug hypodermically, and then placed the animal under a bell-jar and watched it, counting its respirations at frequent intervals. Our results were strikingly uniform. In every case there was a marked slowing of respiration. The rapidity with which this occurred will be best illustrated by an example:—Six observations were made on a large English frog, with the view of ascertaining its normal rate of breathing. It was then injected with ten minims of the liquid extract of gelseminum. In two minutes the breathing had become distinctly slower, in three minutes and a half its rate had been reduced by one-third, and in six minutes by one-half. At the expiration of a quarter of an hour it was only one-third of its original frequency, and in twenty minutes it was so shallow and irregular that it could be no longer counted with accuracy. Sometimes respiration would be entirely suspended for half a minute or longer, and then the animal would move, and several sharp, quick breaths would be taken in rapid succession. Respiration was distinctly affected before there was any appreciable impairment of voluntary power. In all our frogs the respiratory function was abolished long before reflex and voluntary motion had become extinct. In several instances we found that the animals would withdraw their legs when their toes were pinched, for days after the most careful observation had failed to detect the existence of any respiratory movement. The heart was frequently seen beating through the chest-wall long after the complete abolition of respiration. It must be borne in mind that in frogs cutaneous respiration plays a

far more important part in the oxygenation of the blood than in mammalia, and that these animals are but little inconvenienced even by the entire removal of their lungs.

In some cases we were enabled to obtain a tracing of the respiratory movements of the frog, so as to illustrate graphically the effect of the drug. The animal was placed upon its back, and was prevented from struggling by having pinned tightly round it a piece of wetted lint. It soon appreciated the fact that it was unable to escape, and refrained from making ineffectual efforts, remaining very much in the position of a person tucked tightly up in bed. One end of a delicate glass lever was then lightly placed upon the alternately rising and falling submaxillary region, the other end being made to record its movements upon a drum covered with smoked paper, and revolving slowly by means of a simple arrangement of clockwork.

Our experiments relative to the effects of gelseminum on warm-blooded animals were twenty in number, the series including cats, rabbits, guinea-pigs, and a dog. We will, in the first place, describe the effects of a full dose of the liquid extract on a cat. The animal was a full-grown, black tom, weighing 25000 grammes (about 5½ lb.) The observation was made on a cold winter's morning, the temperature of the room being at the time but little above freezing point. The animal was placed under a large bell-jar, care being taken that there was free access of air. Its normal rate of respiration having been ascertained to vary from 28 to 30, it was injected under the skin of the back with ten minims of the liquid extract of gelseminum. In six minutes respiration was reduced to 12, there being no apparent impairment of muscular power. In eighteen minutes respiration had fallen to 8, and there was some loss of power, particularly in the posterior extremities, although the animal was still able to stand. At short intervals it was powerfully convulsed, particularly in the upper half of the body. At the expiration of half an hour the paralysis of the hind limbs was almost complete, and the respiratory movements were so shallow that they could be no longer counted. The convulsions still continued, and for about a quarter of an hour it seemed to us that every movement must be the cat's last. We watched the animal carefully, adopting no treatment, and gradually the breathing improved, and there was some return of voluntary power in the limbs. At the expiration of an hour from the commencement of the experiment respiration was 24, and the animal was able to stand, and even to walk a few steps. From this time the improvement progressed rapidly, and three-quarters of an hour later the breathing had not only returned to, but was slightly above, the normal, and the paralysis had entirely disappeared. The affection of respiration was the first symptom to make its appearance, and the first to pass off. A week later we gave the same cat eight minims of the drug, with the production of similar, though less marked, symptoms. In this experiment, as in the other, respiration was distinctly affected before the muscular power. When the animal was fully under the influence of the drug the breathing was extremely slow, shallow, jerking, and intermittent, expiration being apparently more affected than inspiration. On applying the ear to the chest sibilant râles could be detected. The animal completely recovered from the effects of this dose in a little

\* The Boston Medical and Surgical Journal, Oct. 1st, 1874.

† The Practitioner, Oct., 1870.

‡ The Philadelphia Medical Times, July 31st, 1875.

§ Centralblatt, No. 43, Oct. 2nd, 1875.

less than an hour and a half. Two days later it was made the subject of a kymographic experiment which afforded us an opportunity of noticing several additional points with regard to its mode of breathing whilst under the influence of gelseminum. Twenty-five minutes after the injection of the drug it was found that respiration was very irregular, not only in frequency, but also in depth. At times it nearly ceased, becoming so shallow that it would appear that little if any air entered the chest, a condition usually succeeded by a number of deep, vigorous, and almost convulsive inspirations. This alternation was very suggestive of "brain-breathing," that is of that peculiar character of respiration which is so frequently met with in cases of tubercular meningitis and some other cerebral diseases. The method which we adopted, of first injecting the animal and then allowing it to go loose, or simply placing it under a bell-jar, is well adapted for ascertaining the general effects of the drug, but when it is desired to determine its influence on any particular function it has many disadvantages. The animal naturally moves about, and it is difficult to persuade it to remain sufficiently quiet to have its respirations taken at stated intervals, without the employment of such an amount of force as would invalidate the observation. Moreover the mere act of injecting the drug is apt to quicken breathing, so that some minutes must be allowed to elapse for the animal to recover its equanimity before a trustworthy observation can be made. To obviate these difficulties we sometimes had recourse to anaesthetics. The cat was placed under its bell-jar with a sponge saturated with chloroform. In some five or ten minutes insensibility was produced, and the opportunity was taken of securing the animal on a Czermak's rabbit-holder. The influence of the chloroform being kept up continuously, the drug was injected hypodermically, and its effects noted at regular intervals. By this method we succeeded on one occasion in obtaining fifty-seven observations on the respiration in an experiment of one hour and ten minutes' duration. In other experiments we introduced the drug directly into the circulation through the medium of the jugular vein. In the case of a cat the injection of five minims of the undiluted extract by this method reduced the respiration in two minutes from 27 to 14, and in four minutes to 8, death ensuing about a minute later. It should be stated that no air was introduced with the drug, but it is probable that the spirit contained in the preparation played a not unimportant part in the production of the symptoms. In subsequent experiments on cats, the intravenous injection of even larger doses of the liquid extract diluted with saline solution to one in ten proved fatal far less rapidly.

The drug produces in guinea-pigs much the same symptoms as in cats. In one instance the animal's normal respiration was found, as the result of eight observations, to be from 60 to 64 in the minute. A hypodermic injection of fifteen minims of the liquid extract was then given, and three minutes later the respiration was 80 in the minute. Whether the primary quickening was due to the drug or to the excitement produced by its injection, we are unable to state positively. The respiratory movements fell in twenty minutes to 54, without the appearance of any sign of paralysis. The animal then began to quiver, and in a few minutes was unable to stand. In forty-five

minutes from the injection of the drug the respiration was 30 in the minute, the animal at the time lying on its side and being at intervals slightly convulsed. At the expiration of an hour the breathing was 12, and a quarter of an hour later it was reduced to 6, soon after which the animal died. In all these experiments death appears to have resulted from asphyxia.

The following experiment clearly shows that if artificial respiration can be maintained until the drug is eliminated, recovery will take place. The animal was a white male mongrel poodle, weighing 5896 grammes. Its normal respiration was found, as the mean of twelve observations, to be 18 in the minute. The drug was injected under the skin of the back, the dose being forty minims of the liquid extract. During the first ten minutes the animal was very quiet, no material change in its condition being noticeable. In fourteen minutes it seemed drowsy and sleepy, the head and upper eyelids were drooping, and respiration had fallen to 9. A few minutes later the animal was placed on the floor, when it moved about readily, there being little if any loss of power in the limbs. Respiration was at this time 7, but was gradually quickened by the exercise to 13, and then to 17. The effects of the drug having obviously to some extent passed off, a second dose was given forty minutes after the first. This time a drachm of the liquid extract was injected, care being taken to ensure its absorption by introducing it in divided doses in several different places. In ten minutes the influence of the drug was very apparent. The breathing was again reduced to 13, and was very shallow and somewhat irregular. The impairment of motion was much greater, the animal staggering still more in its walk, falling or running against the wall or any object placed in its way. The last-named condition was undoubtedly in a great measure owing to some affection of sight. Occasionally the breathing was "cerebral," consisting of very superficial, alternating with deep and sighing, respirations. Ten minutes after this observation the animal suddenly became very restless, staggered, and, after taking a deep breath, fell over on its side powerfully convulsed. The convulsions continued with intermissions for about twenty minutes, during which time it was impossible to make any very reliable observations on the rate of respiration. Gradually the chest movements became more and more shallow, and finally the animal ceased to breathe, and was to all intents and purposes dead. As quickly as possible tracheotomy was performed, and a tube was introduced into the windpipe through which air was pumped into the lungs. During the operation the animal was perfectly motionless, but immediately on the establishment of artificial respiration it began to recover, distinct signs of vitality following almost the first expansion of the chest-walls. We cannot give positively the time which elapsed from the cessation of breathing to the opening of the trachea, but it was probably from two to three minutes. Artificial respiration was kept up for about ten minutes, and was then discontinued; after a pause natural respiration was established, though at first very slowly. The chest movements became gradually deeper and deeper, and in half an hour the improvement was so marked as to justify the removal of the tube and the closing of the tracheal aperture. In about a quarter of an hour the animal had a relapse, and the number of respirations was once

more greatly reduced in frequency. The chest was pumped for some minutes, and fears were entertained that it would be necessary to again open the wound, and keep up respiration by that means. The animal was seized with a series of regularly recurrent convulsive movements, but these gradually subsided, and an immediate improvement ensued. A quarter of an hour later the respiration was 17, and the animal was able to sit up, and soon after to walk about, though at first somewhat unsteadily. In about an hour from the relapse the respiration had become almost normal, and the animal was out of danger. In the course of the afternoon he had sufficiently recovered to make a hearty meal. The wound in the trachea quickly healed, and in a day or two the animal seemed none the worse for the dangers through which it had passed.

These observations show—1. That, in animals, gelseminum primarily affects respiration. 2. That it reduces the frequency of the respiratory act. 3. That the affection of respiration appears before the paralysis, and passes off earlier. 4. That gelseminum causes death by asphyxia. 5. That if artificial respiration be maintained until the drug can be eliminated, recovery will take place.

Such are the facts. What is their explanation? On what part of the respiratory system does the drug exert its influence? Dr. Burdon-Sanderson has kindly consented to make the experiments necessary for the solution of these problems, and will publish the results in the ensuing paper.

## THE TREATMENT OF ACUTE RHEUMATISM BY SALICIN.

By T. MACLAGAN, M.D.

(Concluded from May No., p. 224.)

**CASE 4. Acute rheumatism.**—J. G——, aged twenty-six. On Feb. 8th was ailing, and at night was seized with severe pain in the back and limbs, accompanied by fever and tenderness of painful parts.

Feb. 9th.—Skin hot and covered with acid perspiration; tongue furred; bowels moved; has great pain in lumbar region, in knees, in calves of legs, and in elbow and wrist joints, all which parts are tender on pressure; no headache; pulse 104; temperature 102.5°. To have fifteen grains of salicin every two hours.

10th.—Had a better night; pain much less; feels that the powders do him good; tongue cleaner; profuse acid perspiration; bowels moved; pulse 100; temperature 99.5°.

11th.—Passed a good night; is almost free from pain; still perspiring freely; pulse 70; temperature 98.3°.

Remained well, except for aching in knees for a few days.

**CASE 5. Subacute rheumatism.**—Jane S——, aged twenty-three. For the last three weeks has had rheumatic pains, for which she has been taking nitrate of potass with some benefit.

Nov. 30th.—Five days ago she had shivering and much increase of pain. Face flushed; skin warm, not perspiring; pulse 108; temperature 100.8°; heart normal; tongue furred in centre; the

joints of wrists and fingers are swollen and tender on both hands; knees painful and tender to touch, but not swollen. To have half an ounce of castor oil, and twenty grains of salicin every four hours.

Dec. 1st.—No salicin to be had from chemist; has therefore had none. Bowels acted; passed a restless night; had a good deal of pain; wrists and fingers still much swollen; pulse 92; temperature 100°.

2nd.—Commenced the salicin yesterday evening; had rather a restless night; general state much the same; pulse 96; temperature 100.8°.

3rd.—Passed a much better night; pains gone from wrists and knees, but has a little pain in left shoulder, which is tender to the touch; fingers and wrists can now be freely moved without pain; pulse 76; temperature 98.6°.

Progressed favorably.

**CASE 6. Subacute rheumatism.**—William M——, aged thirty, has twice had rheumatic fever. Is of nervous temperament.

Dec. 28th.—For the last two or three days he has felt generally out of sorts, and has had pain in left knee, which has also been swollen. Slept badly last night, and to-day feels general sense of discomfort; has pain in left knee, in both ankles, and to some extent in shoulders; the right ankle and left knee are swollen and tender to the touch; skin natural; tongue slightly furred; pulse 84; temperature 99.5°; bowels moved by medicine. To have thirty grains of salicin every four hours.

29th.—Restless night; to-day he feels very wretched, especially as he cannot move; both ankles swollen and tender; knees less so; pulse 88; temperature 100.5°; bowels confined. To have half an ounce of castor oil; continue salicin.

30th.—Did not sleep well, but thinks he feels better; complains chiefly of inability to move his legs; joints unchanged in appearance, but evidently causing less pain; skin covered with acid perspiration; pulse 96; temperature 100.5°; bowels moved.

31st.—Had decidedly less pain during the night, but did not sleep much; to-day feels weaker, but is not in pain, and looks more cheerful; swelling almost gone from joints, which can now be handled without pain; can move right leg pretty freely; has pain in left arm, between shoulder and elbow, but not affecting either joint; pulse 92; temperature 101.1°. Continue salicin.

Jan. 1st.—Quiet night; pain and swelling gone from joints; has aching in muscles about shoulders; feels much better, and has desire for food; has much acid perspiration, of which he complains more than he does of pain; tongue cleaner; pulse 84; temperature 101.4°.

2nd.—Feels better; still muscular pain in left arm, but nowhere else; pulse 84; temperature 100.1°; takes food with relish. Continue salicin.

3rd.—Good night; no pain; pulse 76; temperature 99.8°.

4th.—Quiet night; free from pain; pulse 80; temp. 99°.

5th.—Ditto, ditto; pulse 56; temp. 98.2°.

Remained well.

**CASE 7.**—James R——, aged forty-four. Has had rheumatic fever three or four times, lasting on each occasion from three to six weeks. Two days ago felt that his old enemy was returning.

Dec. 31st.—Has anxious expression; skin perspiring freely, acid reaction; tongue moist and furred; both knees painful, but not swollen; right

wrist and fingers of both hands swollen and tender; has a soft (probably old) systolic murmur at apex; pulse 96; temperature 99°; bowels open. To have fifteen grains of salicin every three hours.

Jan. 1st.—Bad night; great pain in wrists; knees not so bad; profuse acid perspiration; pulse 96; temperature 99.9°.

2nd.—Better night; bowels moved; tongue rather cleaner; complains only of left wrist; pulse 92; temperature 99°. Continue salicin.

3rd.—Good night; no pain, only stiffness in affected joints, which are still somewhat swollen; pulse 92; temp. 98.8°.

4th.—Pain all gone; skin natural; cardiac murmur unchanged; pulse 88; temperature 98.5°.

Improvement continued. Said that nothing ever did him so much good as the powders, and that he never got over an attack so quickly.

CASE 8. *Chronic rheumatism*.—Alexander L—, aged forty-five, married, was, four years ago, confined to the house for four months with rheumatism. Two years ago he was laid up in the same way for six weeks. On neither occasion were the joints affected, the pain being seated in the muscles and bones. Three weeks ago his old symptoms recurred rather suddenly, and have continued. During this time, under medical advice, he has been taking various salts of potassa, but without the least benefit.

Dec. 1st.—Complains of pain in back and limbs, much increased by any movement; has not got beyond the chair at the side of his bed for three weeks, and that he gets into with great difficulty; skin natural; tongue clean; bowels constipated; pulse 68, feeble; temperature 98°; heart-sounds normal. To have an aperient, and thirty grains of salicin every six hours.

3rd.—Not seen yesterday. Slept better last night than he has done for some time; feels decidedly better. His wife states that he is more cheerful than he has been for weeks; pains not so severe; pulse 68; temperature 98.4°.

5th.—Feels much better; can move about the house freely, having only slight pain in the lumbar region and in the left leg; pulse 68; temperature 98.2°. To have fifteen grains of salicin every four hours.

He continued to improve for some six weeks after leaving off the salicin, when his symptoms returned as badly as before, and this time accompanied by pain and swelling of right wrist. Took the powders of his own accord, and was at work again in a week. Says that nothing ever did him so much good as the powders.

The accompanying charts will show at a glance the daily range of temperature and rate of pulse in the seven cases of acute and subacute rheumatism which have been given. The continuous white lines indicate the temperature, the dotted lines the pulse.

From an examination of these charts alone, especially of the first four, one would almost certainly conclude that they indicated the ranges of temperature and pulse of so many cases of febricula, so rapid and so decided is the diminution of fever which followed the administration of the salicin. A perusal of the details of the cases, however, indicates their true nature. So much febrile disturbance, accompanied by pain and swelling of joints and profuse acid perspiration, form a combination of symptoms which nothing but the rheumatic poison could produce. The

as those to which I have been led, and which, I hope, a more extended experience of its use may confirm.



1. We have in salicin a valuable remedy in the treatment of acute rheumatism.

2. The more acute the case, the more marked the benefit produced.

3. In acute cases, its beneficial action is generally apparent within twenty-four, always within forty-eight, hours of its administration in sufficient dose.

4. Given thus at the commencement of the attack, it seems sometimes to arrest the course of the malady as effectively as quinine cures an ague, or ipecacuanha a dysentery.

5. The relief of pain is always one of the earliest effects produced.

6. In acute cases, relief of pain and a fall of temperature generally occur simultaneously.

7. In subacute cases, the pain is sometimes decidedly relieved before the temperature begins to fall; this is especially the case when, as is frequently observed in those of nervous temperament, the pain is proportionally greater than the abnormal rise of temperature.

8. In chronic rheumatism, salicin sometimes does good where other remedies fail; but it also sometimes fails where others do good.

Regarding the action of salicin on the cardiac complications of rheumatic fever I have no experience. In Case 1, indeed, the muffled and indistinct character of the heart's sounds, which existed before its administration, disappeared with the general improvement which accompanied its use. But it needs not the details of cases to demonstrate that a remedy which curtails the inflammation, or mitigates the severity, of an attack of rheumatic fever, must of necessity diminish in a proportionate degree the risk of cardiac mischief. Whether it is doubtful that the general treatment is suited for rheumatic endo- or peri-carditis is at which most surely and speedily cures the inflammation. Rheumatic inflammation about the heart requires the same general treatment as rheumatic inflammation of a joint.

The dose of salicin is from ten to thirty grains every two, three, or four hours, according to the severity of the case. Fifteen grains every three hours is a medium dose for an acute case. It is very possible that less might suffice; for I have not found the minimum dose. It is very certain that a much larger dose may be given without producing discomfort.

Salicin is not soluble to any useful extent; it is administered as a powder mixed with a little water. It is a very pleasant bitter. I have never found the least inconvenience follow its use. When salicylic acid (originally prepared from salicin) was first introduced, I determined to try it, and in the one case in which I did have recourse to it, it seemed to do good to the rheumatism; but it caused so much irritation of the throat and stomach that I did not repeat it. This was, I doubt, due to its being impure; for Traube has lately been trying it in his wards at Berlin, and reports most favorably as to its action in rheumatic fever.\*

It is the publication of these observations that has led me to give to the profession so soon my favorable and prior experience of salicin in the same disease.

I have no doubt that Traube's observations are

correct, and that salicylic acid will be found efficacious in the treatment of acute rheumatism. But I have as little doubt that it is not so good as salicin for this purpose; for it is more apt to contain noxious impurities, it is not so pleasant to take, and it apparently requires a larger dose to produce its beneficial action.

I shall be greatly obliged if those who try the remedy, and do not care to publish their observations, would kindly forward to me the results of their experience, be it favorable or otherwise. The points to be specially noted are the state of the patient, before taking the salicin, as regards heart, pulse, temperature, skin, tongue, urine, joints, &c., with daily (or more frequent) observations of the same points while under its influence. Observations taken only once a day, to be taken as nearly as possible at the same time on each day.

Dundee.

## ON CONJUNCTIVAL TRANSPLANTATION FROM THE RABBIT TO THE HUMAN SUBJECT.\*

By J. R. WOLFE, M.D., F.R.C.S.E.,

Surgeon to the Glasgow Ophthalmic Institution, and Lecturer on Ophthalmic Medicine and Surgery in Anderson's University.

WHEN the conjunctiva of the eyeball and the corresponding palpebral conjunctiva are destroyed by a burn with hot metal, gunpowder explosion, quicklime, or the like, there results adhesion of the eyelid to the eyeball or cornea, with immobility of the eyeball, &c., called symblepharon. Numerous are the expedients which have been resorted to for the cure of this affection; they have all for their object the mechanical separation of the lid and eyeball until the new surfaces cicatrise. Some surgeons try to effect this by simply dissecting the adherent lid and then tearing up the wound daily for a certain period until it no longer unites. Others, again, try to keep the surfaces separate by interposing foreign bodies, such as sealing-wax, glass shields, &c.; but we always find that nature frustrates our attempt to remedy the deformity by such expedients, for they are based on the supposition that a delicate physiological action can be replaced by a coarse mechanical contrivance. Nature which supplies the organism with lymph, synovia, mucin, and tears for smoothing the various membranes, abhors every motion upon rusty hinges or friction of surfaces, and therefore, whenever such surfaces rub upon each other, they ultimately adhere together.

For a number of years I have practised an operation for the radical cure of symblepharon, by taking a portion of the neighboring healthy conjunctiva of the eyeball wherever I can get it, and supplying the palpebral conjunctiva which has been destroyed; for the loss of conjunctiva oculi, even to a very large extent, is generally regenerated without prejudice to the neighboring tissue, whilst loss of the conjunctiva of the eyelid is sure to damage the cornea by friction. Mr. Teale had first introduced this operation, which I practised independently with considerable modifications.

\* Stricker, in *Berliner Klinische Wochenschrift*, Jan. 3rd, 1876; Riess, in same journal for Dec. 20th, 1875; and *Medical Times and Gazette*, Feb. 5th, 1876.

\* Demonstration held at the annual meeting of the British Medical Association in Edinburgh, August, 1875.

But there is a limit to the extent to which we may go in borrowing conjunctival substance from an eye which has been already injured; if we surpass that limit, the corneal opacity is sure to extend still further, and we lose the last chance of saving vision. Indeed, we sometimes meet with cases in which the infliction of a new wound (in peeling off conjunctiva) would amount to destruction of the eye. It is in these desperate, I would say, almost hopeless, cases that I have devised the method of making up the deficiency by transplanting a portion of the conjunctiva from the rabbit. This method has since been practised by von Wecker, Otto Becker, Albrecht Græfe in cases of symblepharon; and Professor Cohn has shown a case in which he successfully transplanted the conjunctiva from the rabbit into the right eye of a boy five years old, for the cure of the deformity resulting from the removal of a large melanotic tumour of the eyeball.\*

The method having thus had some years' trial by such competent authorities, I shall not enter here upon the theoretical vindication of the procedure, but merely show you two patients upon whom the operation has recently been performed, which will enable you to judge for yourselves of the utter hopelessness of any other method, and of the satisfactory result obtained by this.

CASE 1.—F. B—, aged nine, had his right eye burned with lime in January, 1873, producing adhesion of the lower eyelid to the eyeball to the extent of covering the greater portion of the cornea, the cornea being thus rendered almost entirely opaque, with the exception of the small upper and outer segment. Fig. 1 shows the condition of the

FIG. 1.

eye before the operation. On lifting the upper eyelid the pupil was seen covered by the adherent lower eyelid, and there was no conjunctiva of the eyeball left available for supplying the deficiency. I therefore first turned the transparent portion of the cornea to account, by making an artificial pupil upwards and outwards, whereby I restored a considerable amount of sight. Having procured this advantage, I operated ten days ago for the cure of the symblepharon, by transplantation from the rabbit. I would request the gentlemen present to take a careful view of this patient. You will see that some of the ligatures are still in the new conjunctiva from the rabbit, and on seizing the loose portion of this new membrane with the forceps, it will show you clearly, beyond any possibility of mistake, the vitality of the transplanted portion; you will see that same membrane has some greyish points here and there, while the rest of its surface has assumed a shining pinkish appearance. You

will see also the mobility of the eyeball, and the action of the eyelids restored. Fig. 2 represents

FIG. 2.

the eye with the elevation of the upper and the depress of the lower eyelid.

CASE 2.—P. C—, aged twenty-five, quarryman, received an injury in his face and eyes from a gunpowder explosion in January, 1872. When he first came to the Glasgow Ophthalmic Institution, four months after the accident, his face was quite riddled and discolored by powder; both upper and lower eyelids of the right eye were considerably everted, and the left eye was completely closed and blinded by symblepharon. I made an iridectomy upwards, which resulted in tolerably good sight when the upper eyelid was raised. On presenting himself in January, 1873, I remedied the symblepharon by transplantation from the rabbit.

FIG. 3.

In July, 1875, he came for the treatment of the everted eyelids of the right eye, when I found that a small bridge had formed in the new conjunctiva, which did not mar the result of the operation, this being, indeed, his best eye. However, I separated the bridge, and supplied a new conjunctival flap from the rabbit a fortnight ago.

The examination of this eye will greatly aid us in the appreciation of the method. The extent of the corneal opacity in this case will show the amount of the original injury, which time has considerably repaired. We can also compare here, in the same eye, both the old flap inserted about two years ago and the new small bridge supplied only a fortnight ago, and judge of the satisfactory result. Now, gentlemen, I will proceed to give a detailed account of this operation.

I generally put both the patient and the rabbit under chloroform. I then separate the adhesions so that the eyeball can move in every direction. Next I mark the boundary of the portion of the conjunctiva of the rabbit which I wish to transplant by inserting four black silk ligatures, which

\* Berlin. Klinische Wochenschrift, 1875, No. 26.

I secure with a knot, leaving the needles attached; these black ligatures indicate also the epithelial surface, which would be very difficult to distinguish after separation. I take from the rabbit that portion of the conjunctiva which lines the inner angle, covering the membrana nictitans, and extending as far as the cornea. I select this on account of its vascularity and looseness. The ligatures being put on the stretch, I separate the conjunctiva to be removed with scissors, and I transfer it quickly to replace the lost conjunctiva palpebræ of the patient, securing it in its place by means of the same needles, and adding other two stitches, or more if requisite. Both eyes are then covered with a bandage and dry lint. For the first forty-eight hours the conjunctiva has a greyish look, but it gradually loses that appearance, and, with the exception of some isolated patches here and there, it becomes glistening, in some parts looking not unlike conjunctival thickening. These patches gradually decrease until the whole assumes a red appearance.

Should any irritation set in, I apply warm-water fomentations. With regard to chloroform, Professor Cohn operates on the rabbit without anaesthetics, and I should myself prefer to do so if I could manage satisfactorily, for rabbits do not stand long anaesthesia; but the struggles of the animal are a very great obstacle in the way of the careful dissection required. With regard to the patient, it must be borne in mind that it is a long and tedious operation, taking about three-quarters of an hour in its performance; and that under no circumstances is it safe to maintain insensibility throughout the whole process. In a grown-up intelligent person, therefore, I do it without chloroform; and in the case of the young boy above referred to, I put him under chloroform only during the first stage—namely, while separating and dissecting the adhesions,—and completed the rest by coaxing the patient into submission.

*Accidents during the operation.*—It is always desirable to have at least two rabbits at hand in case one should succumb under chloroform. I may mention also that in one of the operations, after putting the ligatures on the stretch and dissecting the portion of the conjunctiva which I marked out for removal, two of the ligatures with half of the conjunctiva tore away from the rest. To give up this eye and proceed to operate on the other eye of the animal would not have been advisable, on account of the time required to do so; I therefore determined to proceed with the operation in the following manner:—I spread out the portion of the conjunctiva thus removed upon the back of my left hand, and the needles and ligatures attached to it I held in the palm of the same hand, and proceeded to remove the rest of the conjunctiva from the rabbit, and, by means of the remaining two ligatures, I fixed this on the conjunctiva palpebræ. This accomplished, I turned to that portion of the conjunctiva spread out on my hand, which I found dry and firmly adherent to the hand; a few drops of warm water put upon it sufficed to soften it and make it relinquish its hold of the skin, and I then transferred it to its proper destination.

Von Wecker puts the conjunctiva upon a watch-glass, and warm water underneath; but I consider the process accompanied with many inconveniences, and I would never resort to it myself except in a case of emergency. I consider quick trans-

plantation, without previous handling and preparing that delicate membrane, decidedly preferable.

The needles which I employ are half-curved No. 12, which Weiss makes for the purpose. Two small silver spatulae are also requisite for spreading out the conjunctiva. There are various kinds of needle-holders, but I find my own fingers most suitable for the purpose.

In conclusion: although, as stated before, I have resorted to this method only in hopeless cases, when there was no disposable neighboring conjunctiva of the burnt eye for supplying the deficiency, I found the result so highly satisfactory that under no circumstances would I think myself justified in removing healthy conjunctiva from an injured eye; but in all cases I would supply the deficiency from the conjunctiva of the rabbit, as being the safest and best method now at our disposal for the cure of such injuries.

Glasgow.

### OBSTRUCTIVE SUPPRESSION OF URINE AS A CONSEQUENCE OF RENAL CALCULUS.

By JAMES MIDDLETON, M.D.

THE most common cause of obstructive suppression of urine is the impaction of a calculus in the ureter of a person having only one kidney capable of secreting urine; the other having previously become disabled by disease or accident. The following case, which came under observation last spring, seems to possess considerable interest, as presenting a typical example of this affection.

G. W—, a commission agent, aged forty-nine, married. Though not intemperate, he had always lived freely till within the last eighteen months, since which he has been more regular in his habits. He had always enjoyed excellent health, and from childhood had "never required a doctor" till about three years ago, when he suffered from a large carbuncle on the left hip, which was freely incised and healed quickly. In November, 1873, he for the first time suffered from an attack of gravel, during which he complained of "sickening pain" in the right lumbar region, extending thence along the course of the right ureter and to the right testicle. He was not aware of having passed any calculus during this attack. In May, 1874, he had a second attack of renal colic, during which the pain was exclusively referred to the left lumbar region and the course of the corresponding ureter. This attack terminated in the passage of a uric-acid calculus, in size and shape resembling a barleycorn. For some time after this attack the urine continued highly acid and loaded with crystals of uric acid, but under treatment with citrate of potash, extending over a period of nearly eight weeks, it became perfectly normal, and he assured me he felt better than he had done since the date of his first attack.

From this time he enjoyed very good health, till Feb. 17th, 1875, when he was again attacked with renal colic confined to the left lumbar region, and the urine became scanty, pale in color, and of low specific gravity. From 9 p.m. of the 17th till 10 p.m., on the 20th no urine whatever was voided. About 10 p.m. on the 20th he passed about an ounce and a half of very pale

urine; specific gravity 1006. The urine continued to be passed in increasing quantity for the two following days, but presented the same pale color and low specific gravity, 1005 to 1007. On the 23rd the flow of urine was again arrested, but returned in considerable quantity the following morning. From 9.30 p.m. on the 24th till 10.15 p.m. on the 27th the urine was entirely suppressed. He then passed five ounces of very pale urine, specific gravity 1008. Between 10 p.m. on the 27th and 10 p.m. on the 28th he passed eight ounces of urine, specific gravity 1008, and presenting the same general characters as on the previous day. From 10 p.m. on the 28th Feb. till 10 p.m. on 1st March he passed six ounces, specific gravity 1007. From the evening of 1st March till the afternoon of the 6th he continued to pass urine daily, varying in quantity from five ounces to eight ounces; very pale in color, and of specific gravity 1005 to 1008. Between the afternoon of the 6th and the morning of the 8th the flow of urine was again entirely suppressed. On the morning of the 8th he passed six ounces, presenting the same characters as previously described, and during the day he passed a larger quantity than he had done during any corresponding period since the commencement of the attack—thirteen ounces within ten hours. At 6.30 p.m. on the 8th he expired, having lived nineteen days from the commencement of the suppression.

Until the evening of March 4th there was a total absence of any constitutional symptoms indicating that so important a function as the secretion of urine was suspended. Up to this time his tongue, skin, and pupils were natural; there had been scarcely any nausea or vomiting, the appetite was fair, there was scarcely any headache or insomnia, the pulse was steady at about 78, respiration 24, and temperature normal. On visiting him about 10 p.m. this evening I noticed for the first time slight twitchings of the muscles of the arms. He had now little or no pain in the lumbar region, and any of which he complained was rather of a dull aching character than sharp and lancinating, as at the commencement of the attack. He had scarcely any desire to pass urine, though frequently expressing anxiety about its suppression. The skin and bowels had acted freely.

March 5th.—The muscular twitchings were somewhat more marked, and were observed in the lower as well as in the upper extremities. There was also considerable muscular weakness manifested when he attempted to walk.

6th.—The muscular twitchings were more frequent and severe, and he was unable to walk or stand without assistance. Pulse slightly increased in frequency, 80; temperature falling. He complained of slight thirst and occasional nausea after taking food. Up to this time he slept pretty well, and took a fair amount of nourishment.

7th.—All his symptoms became more pronounced. Pulse 82, irregular; temperature 98.7°; respiration 20, much embarrassed and of a peculiar panting character; tongue dry and slightly coated; great muscular prostration, and twitchings frequent over the whole body; occasional nausea and vomiting; his countenance expressive of great anxiety; intellect unaffected; pupils natural.

8th.—Passed a most restless night, constantly having his position changed or asking for his limbs to be rubbed; muscular twitchings almost incessant over the whole body, and power of legs quite gone.

Placing his hand on the epigastric region, he said: "Above this I am as sound as a bell, below it I am quite dead." Inspiration prolonged and laborious; expiration short and panting; pulse 82; temperature 98.4°; pupils slightly contracted, but acting under stimulus of light; consciousness and intelligence unaffected; occasional vomiting and hiccough; appetite quite gone. During the day his symptoms became more and more distressing, and in the evening, while giving some instructions regarding his affairs, he suddenly expired. There was no coma or convulsion throughout, and his intellect remained unclouded to the last.

*Autopsy, twenty-four hours after death.*—Strong rigor mortis; body well nourished, and quite free from any urinous or ammoniacal odor. The post-mortem examination was, at the request of the relatives, confined to the abdomen. All the organs were healthy except the kidneys and ureters. The right kidney weighed four ounces and a half; it was pale in color; the capsule was thickened and irregularly adherent, and the subjacent surface was rough, and studded by a few small cysts. On section, the cortical portion was much atrophied, the bases of the cones in some places being almost continuous with the surface of the kidney. The cones themselves were very pale in color, irregular, and few in number. The corresponding ureter was of normal calibre, and pervious throughout its course from the kidney to the bladder. At the latter point, however, an elongated uric-acid calculus, weighing three grains and a half, was found firmly impacted, and completely occluding the terminal portion of the canal, where it passes through the coats of the bladder. The left kidney was considerably enlarged, weighing eleven ounces and a half, and presented a dark and highly congested appearance. The capsule was slightly thickened and adherent; the surface was smooth and uniformly congested. On section, the renal substance was intensely injected throughout, the cones presenting a somewhat deeper color than the cortex. The latter was relatively increased in bulk, denser than normal, and presented a uniform bright-red color. Lying in the pelvis of the organ, and accurately moulded to its shape, was a large uric-acid calculus, which upon removal was found to weigh 146 grains. Extending from the convex border of this mass a prolongation passed into the central infundibulum, while two lateral prolongations in like manner extended into the upper and lower infundibulum. A fourth prolongation, longer and thicker than those already mentioned, and gradually tapering towards its termination, extended from the concave border of the mass and passed into the ureter. The calyces were filled throughout with uric-acid concretions, varying in size from three grains to a coarse powder. In addition to the large calculus, forty-five grains of this deposit was also removed. The pelvis and ureter were scarcely if at all dilated. At the terminal portion of the ureter a small uric-acid calculus, weighing two and a half grains, was found firmly impacted. It had the appearance of having become detached from the larger calculus lying in the upper portion of the ureter. In the rest of its course the ureter was pervious. Two ounces of very pale urine were found in the bladder.

The history of this man's case clearly demonstrates the fact that he had lived through an attack of uretral plugging terminating in the destruction

of the right kidney. The left kidney then became hypertrophied, and continued to perform double duty until the left ureter became similarly blocked. The secretion of urine was thus permanently arrested, and death resulted from uræmic poisoning.

In reviewing the symptoms presented by this case, we cannot fail to note the length of time which elapsed before any indication of uræmic poisoning became manifest. For fifteen days from the commencement of the attack he showed no symptoms of disturbed health. Subtlety of the tendons of the wrist, and progressive muscular weakness, were the earliest indications of the approach of the uræmic state. As the muscular prostration advanced the breathing became slow, laborious, and panting, with a lengthening pause between inspiration and expiration.

During the course of the disease the urine was excreted at very irregular intervals and in varying quantity, but throughout it invariably presented the same pale, watery color, totally devoid of its ordinary coloring matter, and, however small in quantity, never manifesting any material increase in specific gravity.

The appetite continued good till near the end; the skin was generally moist, often perspiring; and the intellect remained unclouded to the last. There was no dropsy, no persistent vomiting, and no ammoniacal odor from the breath or skin, nor from the body after death.

Manorhead, Stow.

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NOTES OF A

CASE OF FUNGUS OF THE DURA MATER;

WITH REMARKS.

By JAMES F. WEST, F.R.C.S.,

Senior Surgeon to the Queen's Hospital, Birmingham.

EMMA F—, aged forty, was admitted into the Queen's Hospital on Nov. 18th, 1875, under Mr. West. The patient had been married twenty years, and had nine children, and one miscarriage; four of her children are dead; three died in infancy, from three to four months old. She has been accustomed to carry bricks on her head, having worked in a brickyard. There was no history of any particular blow on the head, but she has been knocked about a good deal with fists by her drunken husband. She states that she suffered from what was called rheumatic fever by a medical man last January, but no pain or swelling of any joint occurred, although at that time there was very severe pain in the head, and she noticed three painful lumps rise on her head: one in each temporal region, and one in the right parietal region. Those in the temporal region soon disappeared, but that in the parietal became more swollen, painful, and tender, and was opened by her medical attendant, when a large quantity of matter escaped, and the wound has continued to discharge pus ever since.

Six weeks ago pieces of dead bone began to come away, and on Monday, Nov. 22nd, Mr. West removed a shell of necrosed bone nearly an inch square involving the entire thickness of the skull,

which he found standing out from a ragged, elevated ulcer on the scalp; two smaller pieces were removed from the edges of the wound, leaving a pulsating mass protruding from the interior of the cranium, about the size of a walnut, more or less globular in shape, and presenting all the characters of a hernia cerebri, except that the pulsation was not synchronous with the respiration. There were exuberant granulations around the edge of the wound, and marked tenderness and swelling of the surrounding scalp.

The patient is fairly well nourished; face somewhat florid, with enlarged capillaries. She states that she lost flesh from the commencement of her illness up to four months ago, when she was so feeble as to be unable to walk across the room; since then, however, she has gained flesh and strength, and now feels quite well, with the exception of occasional headache, not severe, and worse in the morning; eyesight failing slightly during the last five or six weeks; no difference in size of pupils; no numbness or twitching in the limbs; no change in intelligence or loss of memory. No history of syphilis can be elicited.

On Monday, Nov. 29th, Mr. West had the patient put under the influence of ether, and made three exploratory radiating incisions through scalp, so as to expose the bone in the neighborhood of the tumour. He removed several pieces of necrosed bone, and discovered a hole in the cranium about one inch square, through which a fungating tumour passed, which seemed to spring from the dura mater.

The patient went on well after the operation, and on Dec. 6th Mr. West ordered a well-padded mould of gutta percha to be applied over the tumour, so as to exercise moderate pressure upon it. This was well borne, and about the 27th December the tumour had disappeared, and had cicatrised over. About this time, however, she began to have occasional numbness in the extremities and loss of speech, and on the evening of Dec. 27th she had a fit, in which she lost consciousness; had right-sided convulsions, the right arm being twitched and the hand turned inwards; there was also rigidity of the right leg, twitchings of the facial muscles, and some dilatation of the right pupil. In the next few days the fits became more frequent, at first left-sided, and afterwards general, and she died comatose on Jan. 2nd, 1876. No rise of temperature took place till the last two days, when it rose to 102°.

A post-mortem examination was made on Jan. 4th. Scalp stripped off and brain removed by Hutchinson's method. No meningitis; no effusion along the course of the vessels, but great congestion of the meninges and of the brain-substance. Three or four flat hard nodules in the dura mater covering the right hemisphere, about half an inch thick, flattening the convolutions beneath, and causing absorption of the bones of the skull on which they pressed. No protrusion from the aperture in the cranium; the brain-substance came up to the surface of the scalp, and was only covered over with a thin cicatrix. On the internal surface of the right parietal bone, around the opening, the brain and thickened dura mater were incorporated together, and were adherent to the margin of the bone. The aperture in the right parietal bone was ragged and irregular in shape, two inches in length by one in width. On the outer surface of the frontal bone, about an inch in front of the parietal

opening, there was erosion over a space as large as a shilling, and a sequestrum of the tubula crassa was beginning to separate. Deep and disseminated in the substance of the liver, five or six round masses, as large as a walnut, were found, which, with those in the dura mater, presented all the microscopic characters of scirrhus. The lungs, heart, kidneys, and uterus were healthy, and there were no enlarged abdominal glands.\*

*Remarks.*—Fungus of the dura mater is not very uncommon, but its insidious approach, and the difficulties attending its pathology and diagnosis, induce me to place this case on record.

Pathologists differ as to the exact category in which such tumours should be placed, as to whether they should be considered as simply fibroplastic or as cancerous growths. I incline to the opinion that this was a cancerous growth, from the general and microscopic appearances it presented; and I prefer to call it scirrhus from its hardness, the abundance of fibrous material in its structure, its not being very vascular, and from analogous tumours existing simultaneously in the substance of the liver.

Considerable variety of opinion also prevails among those who have written on this subject as to the starting-point of the disease: some authors—as Louis and Chelius—assigning the dura mater as the part from which the disease springs; others, as Siebold, thinking that cancer may arise in the diploe; while Mr. Oliver Pemberton, in his “Clinical Illustrations of Cancer,” narrates the case of a woman, aged twenty-seven, in whom the cancer originated in the compact tissue of the cranial bones.

Rindfleisch, one of the most eminent of modern German pathologists, gives the following sketch of the growth and progress of this disease:—“The fungus of the dura mater springs from the outer surface of the membrane, forces its way along the vessels into the compact tissue of the bone, destroys the tabula vitrea, extends somewhat less actively in the diploe, but ultimately perforates the outermost compact layer of the cranial bones, protruding as a fungoid tumour and pushing the scalp before it. Not unfrequently, too, it extends inwards through the dura mater, the opposed surfaces of the arachnoid are glued together, and then a fungus of the pia mater becomes associated with that of the dura mater.”†

A very good account of these tumours is given by Mr. Lawson Tait in a paper entitled, “On the Variety of Periosteal Disease of the Skull generally known as Fungus of the Dura Mater,” published in the *British and Foreign Medico-Chirurgical Review* for January, 1870. It contains a good *résumé* of the cases recorded by various authors, and concludes:—“These tumours may be regarded as homologous, according to Virchow’s recent definitions in his lectures on tumours. They originate in the layers of osteal cells, and are composed of those cells altered in appearance and degenerate in function. When, together with the altered histological characters, the clinical history of the tumours is considered, they ought to be ranked among cancerous diseases.” The appearance presented by the cranial bones in my case certainly tends to confirm Mr. Tait’s opinion as to the disease originating in the osteal cells, for

the outer layer of the skull was superficially eroded over the space of a square inch in front of the spot where the actual perforation had taken place, while the corresponding portion of the tabula vitrea and the subjacent dura mater appeared unaffected by the cancerous disease; at that point, at any rate, there could have been no pressure from within, and yet the bone was softening down in such a way that probably before long a second opening into the cranium would have been formed.

My case is unique in affording proof of the co-existence of malignant disease in another organ. In the case which Mr. Tait records this evidence is wanting, as he had no opportunity of examining any of the thoracic or abdominal viscera. Although the patients is said to have died of tubercular disease of the lungs, Mr. Tait seems to suggest that possibly there may have been cancer in some other organ. I believe that in my case the disease began in the periosteal layer of the dura mater, and that although the perforation of the skull which already existed was due to the more active growth of that portion of the disease which had its seat in the dura mater, there was also a concomitant affection of the pericranial covering of the skull, and that another aperture in the cranium would soon have resulted from the extension of the disease from without inwards.

The following points appear noteworthy in the clinical history of the case:—The patient had been in the habit of carrying heavy weights, and had frequently had blows on the head. It is difficult to say whether these injuries had anything to do with the causation of the disease; probably they had, but certainly, as far as we could ascertain, syphilis had not. Another feature of interest was the absence of any cerebral symptoms until within a few weeks of her death, and their on-coming soon after the outward growth of the tumour had been checked by the application of very moderate pressure to its surface. Relief of pain followed the removal of the necrosed fragments of the skull on each occasion.

For the establishment of a correct diagnosis, the exploratory operation undertaken on Nov. 29th was most satisfactory; until then I could not be positive as to the nature of the disease of the skull, and until the post-mortem examination itself, I was unaware of there being any implication of the liver. To the tumours being small, separate, and not extending to the surface of the organ, it is perhaps due that no symptoms of hepatic derangement, no pain or icteroid tinge of the surface, were ever present, and yet cancerous masses must have been forming in the substance of the liver for a considerable time.

Birmingham.

## CONTRIBUTIONS TO AURAL SURGERY.

By W. B. DALBY, F.R.C.S., M.B. Cantab.,

Aural Surgeon to St. George’s Hospital.

### No. IV.—ON THE DIAGNOSTIC VALUE OF MORBID APPEARANCES IN THE TYMPANIC MEMBRANE.

It would be very difficult to find a more remarkable instance where careful observation of morbid changes can help to illustrate the uses of

\* For the notes of this case I am indebted to Dr. M’Queen, senior house-surgeon of the Queen’s Hospital.

† Rindfleisch, *Pathol. Histology*, vol. ii., p. 359.

individual parts of an organ than occurs in the case of the tympanic membrane. It would be still more difficult to cite examples where more mistakes have been made in respect of such changes as immediate causes of impaired function. Even at the present time one hears it often enough said of a child (Ex. 1) who has become completely deaf after scarlet fever, or an attack of inflammation of the tympanum due to some other cause, and accompanied by total loss of the tympanic membranes, that he is deaf from perforations of the membranes. But, again, another child or adult (Ex. 2) with a similar complete loss of the membranes is the subject of impaired hearing of so slight a character as to occasion little or no inconvenience, and only noticeable when subjected to careful tests; whilst another (Ex. 3) with the same lesion is very deaf, and regains most satisfactory hearing by wearing a contrivance to which the term has been applied "artificial membrane." The explanation of this effect which was originally offered was that the improved hearing was due to the fact that this contrivance confined the vibrations of sound to the tympanic cavity, and thus performed in part the functions of the natural membrane. If this were a correct view of the matter, why should this method so frequently be found quite useless when, instead of so great a loss of tissue, there is only a small perforation? In truth, experience shows that where the perforation is minute, it is even more usual to meet with extreme deafness than when it is larger, and that the artificial closure of the perforation only causes increased deafness. Those who are in the habit of treating cases of perforation of the tympanic membrane are now well aware that in suitable examples the success or failure which attends artificial support, however applied on to the tympanum, depends solely upon the degree of exactness with which the precise spot requiring pressure is discovered, and that, in fact, as soon as the patient has acquired facility in using aid of this sort to hearing, he can at any time, with the help of forceps and a small probe, so adjust a piece of moistened cotton-wool that the requisite pressure is exerted on the stapes. In such instances, then, it is quite obvious that the impaired hearing is due simply to a defect in the normal amount of tension throughout the ossicles, and so on to the fenestra ovalis. It is equally just to suppose in those cases where this expedient fails after fair trial, that the loss of hearing is due to disorganisation in the tympanic cavity beyond what can be accounted for by the change in tension above-named. That the loss of the membrane, *per se*, can have caused this is at once negatived by the consideration of Ex. 2. From the result of previous well-known dissections it may be presumed that this further disorganisation takes the form of a general thickening of the lining membrane of the tympanic cavity, as well as other changes elsewhere described. The probable truth of this explanation is made more apparent, when the opposite ear is perfect, by the fact that the vibrations of sound conveyed through the cranial bones are heard better by the affected than by the other (healthy) ear; for in this case the increase in the perception of sound would seem to be caused by some obstruction in the tympanum which interferes with the outward passage of sound through this cavity. At any rate, it is manifestly incorrect to attribute all the deafness met with in perforation of the tympanic membrane

to that part of the morbid condition which a superficial examination at once discloses.

To take another illustration of the loose way in which cause and effect are spoken of in relation to one another. What more common than to hear it said of a patient who is more or less deaf on one side that he has "thickening of the membrane" (meaning the tympanic membrane)? How true an explanation of his malady this may be can be judged from the following:—An adult is found to have a large calcareous deposit in both tympanic membranes, is quite deaf with one ear, and has imperfect hearing with the other. Another patient is obviously deaf from nervous causes in the right ear, and on examination of the left ear, with which the hearing is perfect, it is found that the membrane is the seat of large calcareous deposit; whilst a third, with still more extensive deposit of a similar kind in both membranes, hears quite well on both sides. Each of these examples I have myself observed. Surely in any one of them there is sufficient "thickening of the membrane" to account for any degree of deafness, but it is nevertheless plain enough that this symptom is in no way due to such a cause. In the face of this may we not be justified in supposing the failure in conduction of sound to be due (as in the case of perforation) to morbid changes behind the membrane? Do not facts like these still further point towards the necessity which exists for some modification in the views popularly held of the functions of the tympanic membrane, at least so far as its vibratile properties are concerned? It seems not easy to understand how the vibrations of this membrane, so thickened and changed by disease as we see it sometimes, can be a very essential factor in the function of good hearing, and is not this what is generally taught in physiological text-books? For instance, it is explained in that charming little work of Mr. Huxley's on *Elementary Physiology* that those aerial waves (produced by the vibrations of sonorous bodies) which enter the meatus, impinge upon the membrane and *set it vibrating*; that the vibrations set up in the membrane of the tympanum are communicated in part to the air contained in the drum of the ear, and in part to the malleus and thence to the other auditory ossicles. We are not here concerned with the effect of the vibrations communicated by these routes to the fenestra ovalis on the one hand, and to the fenestra rotunda on the other. But to take the two cases above quoted, the one in which the ear has entirely lost the membrane by ulceration, and the other in which the membrane has become metamorphosed by calcareous degeneration, nearly perfect hearing remaining to each, must we not almost put out of consideration the *vibrations of the membrane* which intervene between the aerial waves in the meatus on the one side, and the vibrations of the ossicles and the vibrations in the air contained in the tympanic cavity on the other? In short, the functions of the membrane as a medium in sound conduction wellnigh disappear, whilst its functions as a support to the chain of ossicles and as a protection to the tympanic cavity become proportionately more noticeable.

Whatever truth there may be in this mode of reasoning makes it tolerably plain that to talk of a slight thickening of the membrane, or a small perforation, as a cause of extreme deafness, implies a misapprehension of the diagnostic value of such pathological changes. This is made still more ap-



parent, as regards perforation of the membrane, by the consideration of cases reported in *THE LANCET*, August No., 1875, where some accidental ruptures of the membrane were not attended by any appreciable loss of hearing power.

A due regard to the value of appearances in the tympanic membrane, far from inducing a superficial examination of this part, should make inquiries in this direction the more exhaustive, so that changes from health may become the marks on an index telling of still further changes beyond. Thus, a loss of translucency and lustre in the membrane points at once to catarrh either past or present. If past, either recovered from or having left impaired hearing, which tells truly of induration in the lining membrane of the tympanum; if present, showing surely that secretion has lately or is still taking place, and so calling for immediate treatment. Beyond all other changes in the tympanic membrane in diagnostic value and as a guide to treatment, are deviations from the natural plane of the membrane. A passing or permanent obstruction of the Eustachian tube cannot fail to leave its mark on this structure by the increase of its curvature and alteration in position of the malleus. No less important are the partial or complete collapse of the membrane, increased mobility on inflation of the tympanum, as well as thinning of the membrane in parts, together with bulgings and bladder-like protrusions. All these appearances and many more mark in language plain and intelligible the results, and for the most part remediable results, of catarrh of the middle ear.

## HOW TO CURE A COLD IN THE HEAD.

By DAVID FERRIER, M.D.,

Assistant-Physician to King's College Hospital.

THOUGH a cold in the head gives rise to much discomfort and uneasiness, it is not usually considered grave enough to necessitate professional advice; and the unfortunate victim of nasal catarrh, with watery eyes, running nostrils, sneezing, and nasal speech, is more often regarded as a subject of ridicule rather than of sympathy or commiseration.

Being occasionally liable to severe nasal catarrh, often of prolonged duration, and having a lively sense of the inconvenience and discomfort attaching to it, and being threatened with a cold in the head one evening lately, with prospect of serious inconvenience to public speaking next day, I endeavored to devise some plan of treatment more speedy and efficacious than the usual one of "sudorifics and lying in bed." Having succeeded almost beyond my expectations, and having since found the method equally successful in the case of others to whom I have recommended the treatment, I offer it in the hope that it may prove equally efficacious in the hands of others. As the local symptoms of cold in the head are the chief source of annoyance and discomfort, local treatment seems the most rational.

The symptoms being those of acute catarrh of the nasal mucous membrane, the treatment which seemed to me most likely to succeed was that which I have always found most efficacious in acute catarrh of the gastric mucous membranes.

In the acute catarrh of alcoholism accompanied with profuse secretion of mucus, which is often vomited up in large quantities almost without effort, as well as in the more chronic forms of gastric catarrh, bismuth alone, or in combination with morphia, acts almost like a specific.

On the same principle the topical application of bismuth to the nasal mucous membrane seemed to me the plan most likely to be followed by beneficial results. I do not know whether the plan is absolutely original, but I am not aware of its having been adopted previously. This, however, is of no importance compared with the question of its efficacy.

On the evening in question I began to suffer with the symptoms of cold in the head—irritation of the nostrils, sneezing, watering of the eyes, and commencing flow of the mucous secretion. Having some trisnitrate of bismuth at hand, I took repeated pinches of it in the form of snuff, inhaling it strongly, so as to carry it well into the interior of the nostrils. In a short time the tickling in the nostrils and sneezing ceased, and next morning all traces of coryza had completely disappeared.

Bismuth alone, therefore, proved quite successful, but it is better in combination with the ingredients in the following formula. Bismuth by itself is rather heavy, and not easily inhaled, and it is, moreover, necessary that it should form a coating on the mucous membrane. It is, therefore, advisable to combine it with *pulv. acaciae*, which renders the bulk larger and the powder more easily inhaled, while the secretion of the nostrils causes the formation of an adherent mucilaginous coating, of itself a great sedative of an irritated surface. The sedative effect is greatly strengthened by the addition of a small quantity of hydrochlorate of morphia, which speedily allays the feeling of irritation and aids in putting a stop to the reflex secretion of tears.

The formula which I find on the whole the most suitable combination of the ingredients of the snuff is as follows:—Hydrochlorate of morphia, two grains; acacia power, two drachms; trisnitrate of bismuth, six drachms. As this is neither an errhine nor a sternutatory, but rather the opposite, it may be termed an anti-errhine or anti-sternutatory powder. Of this powder one-quarter to one-half may be taken as snuff in the course of the twenty-four hours. The inhalations ought to be commenced as soon as the symptoms of coryza begin to show themselves, and should be used frequently at first, so as to keep the interior of the nostrils constantly well coated. Each time the nostrils are cleared another pinch should be taken. It may be taken in the ordinary manner from between the thumb and forefinger, but a much more efficacious and less wasteful method is to use a small gutter of paper, or a "snuff-spoon," placing it just within the nostril and sniffing up forcibly so as to carry it well within. Some of the snuff usually finds its way into the pharynx, and acts as a good topical application there, should there be also pharyngeal catarrh. The powder causes scarcely any perceptible sensation. A slight smarting may occur if the mucous membrane is much irritated and inflamed, but it rapidly disappears. After a few sniffs of the powder, a perceptible amelioration of the symptoms ensues, and in the course of a few hours, the powder being inhaled from time to time, all the symptoms may have entirely disappeared.

I am writing this note cured of a cold in the head which I began to manifest in a very decided manner last night—viz., weight in the frontal sinuses, tickling of the nostrils, sneezing, watering of the eyes, and commencing flow of the nasal mucus.

I commenced taking the snuff, continuing at intervals for about two hours, thoroughly coating the interior of the nostrils with it. Next morning I found myself entirely free from catarrh. The effects in my own case have been twice so rapid and beneficial that I look with comparative indifference on future colds. In the case of others to whom I have recommended the same treatment equally rapid and beneficial results have followed. One of my students in King's College Hospital described the effects as quite magical and unexpected, having in this way got rid of a cold in one evening. The other day one of the officials in King's College asked me if I could do anything to check a dreadful cold in the head which he had just caught. I gave him the above prescription, asking him to note the results. A day or two after he came and told me that I had given him very marvellous snuff, as he had not taken more than one-eighth part before he had got rid of all his uneasiness and discomfort. Though I have not yet had very many opportunities of trying this method of cure, the success so far has been such as to warrant my recommending it as a rapid and efficacious treatment of nasal catarrh.

Upper Berkeley-street.

## A Mirror

OF

## HOSPITAL PRACTICE

BRITISH AND FOREIGN.

*Nulla autem est alia pro certo noscendi via, nisi quamplurimas et morborum et dissectionum historias, tum aliorum, tum proprias collectas habere, et inter se comparare.*—MORGAGNI *De Sed. et Caus. Morb.*, lib. iv. Proœmium.

### ST. MARY'S HOSPITAL.

RETROVERSION OF THE GRAVID UTERUS; RETENTION OF URINE; RECOVERY.

(Under the care of Dr. WILTSHIRE.)

CAROLINE O—, aged thirty-seven, married twenty years, has had nine children and four miscarriages; the youngest child is two years old; labours generally quick. Thirteen years ago had small-pox, and since then has had constant pain in the small of her back and great trouble with her water, being unable to pass more than a small quantity at a time. The urine is always "furred red"; micturition is occasionally painful; she is generally rather constive, and suffers much from bearing-down pain during defecation; says her motions now "hurt her wonderfully."

For a fortnight previous to admission she could pass only very small quantities of urine at a time. On the 21st of December, 1875, five days before admission, she lifted some heavy tubs while wash-

ing, and thinks she then strained herself. On the 26th, the day of admission, after a railway journey which shook her very much, she found herself quite unable to micturate. A medical man who was called in passed a catheter and drew off some urine, after which he sent her to the hospital.

Mr. Wade, the acting obstetric house-surgeon, between the 26th and 28th drew off a small quantity of urine, but as the size of the abdomen did not diminish and the pain and other symptoms became worse, she was seen by Dr. Wiltshire on the 28th, who noted the following condition:—The patient was lying on her back with her legs widely apart and slightly drawn up. The countenance had a pained and worn expression. She complained of a good deal of pain in the lower part of the abdomen, and she eructated frequently, and occasionally vomited bilious looking matter. The tongue had a moist silvery coating. The temperature was normal; pulse 80, and of good volume. There was a urinous odor about the patient; she believed herself to be three months pregnant. The abdomen was very prominent, slightly more so to the left of the middle line than elsewhere. It was as large as if five and a half or six months pregnant, and distinctly fluctuated everywhere. There was dullness on percussion all over the tumour. Flanks resonant. On vaginal examination it was found that the finger, immediately after passing the ostium vaginae, impinged on a tense globular mass about the size of a gravid uterus of three and a half to four months. This nearly touched the perineum, and considerably narrowed the calibre of the vagina. The mass could be traced high up anteriorly until it became lost beyond the reach of the finger. The cervix uteri pressed against the urethra, which was, indeed, compressed between the cervix and pubic arch. The os uteri could not be felt except by painful pressure, and then only the lower lip could be reached. The diagnosis was clearly that of a retroverted gravid uterus, with consequent retention of urine.

A No. 8 gum-elastic male catheter was used to draw off the urine, but it was found not to be sufficiently flexible to ride over the neck of the uterus and dip down into the bladder without causing pain; a No. 3 was therefore substituted, and 44 ounces of urine were withdrawn by it. The urine had not become decomposed; it was acid, specific gravity 1016, and contained no albumen. After the evacuation of the bladder the cervix uteri could be distinctly felt just above the pubes. This was verified by internal examination. The position of the uterus was found to be much as it was before the urine was drawn off. Reduction was effected by steady and gentle pressure on the fundus upwards and to the right, so as to avoid the sacral promontory, and by simultaneous downward pressure on the supra-pubic cervix, the manœuvre resembling that of bipolar version. The patient was directed to lie in the prone position as much as possible. Ordered liberal diet and wine. To have fifteen grains of chloral at bedtime.

Dec. 29th.—Looks wonderfully better, and expresses herself as feeling so. No vomiting. Had a very fair night's sleep. Has passed water four times without difficulty, and a motion once without pain. On abdominal palpation the uterus can be felt in its normal position, and is about as large as a gravid uterus of three to four months.

The patient was discharged well on the 1st of January.

*Remarks by Dr. Wiltshire.*—This was a typical case of retroversion of the gravid uterus with consequent retention of urine. There was, as there very commonly is, a history of sudden straining (in this case from over-exertion), and there can be no reasonable doubt that the uterus was displaced backwards during the strain. When once this has happened mechanical retention of urine begins, and becomes aggravated as the accumulation of urine continues, the cervix becoming more and more jammed against the pubic bone. There may be, as there generally is in retention, in the male as well as in the female, a dribbling, and this may prove misleading unless it be looked upon, as it should be, as a symptom of *retention*, and not of *incontinence*. The importance of using a long and flexible catheter (which is my invariable custom in females) was well illustrated by this case. Even a well-warmed No. 8 was found to be too unyielding to curl over the cervix and dip down into the bladder, and a No. 3 was therefore substituted. In other similar cases which I have seen I have never found the cervix to be so plainly distinguishable above the pubea. According to my observations, distension of the perineum is usually a more or less marked symptom, the bulging increasing in proportion to the accumulation of urine in the bladder.

#### TREATMENT OF RHEUMATIC FEVER BY SALICYLIC ACID.

(Under the care of Dr. BROADBENT.)

Few diseases have had brought against them a heavier armament of drugs than has acute rheumatism. It has been stormed by alkalies and salines, attacked by acids, assaulted by perchloride of iron and by quinine, surprised by propylamine and claychlorure, drained by venesection and purgatives, flooded alternately with hot and cold water, alarmed with blisters, blasted with hot air, lulled by opium, and appeased by chloral hydrate. In addition to these, it has been constantly harassed by the raids of lesser foes, such as lemon-juice, citric acid, belladonna, and iodide of potassium. Now another apparently powerful enemy has appeared. Salicylic acid has been shown by Stricker to be able to prevail against some cases of acute rheumatism, and Dr. Broadbent's experience seems to confirm this character. The beneficial action of the drug in the following cases was constant and unequivocal. Whether the reputation of this remedy will prove more durable than that of its rivals remains to be seen. The drug is at least worthy of a careful and complete trial.

For the following notes we are indebted to Mr. Jackson Gawith and Mr. H. Sworder, house-surgeons.

CASE 1.—E. H.—, aged thirty-one, domestic servant, was admitted Feb. 2nd, suffering from rheumatic fever. She was first taken ill on Jan. 28th. On admission, she had severe pain in the left ankle, the right knee (which was greatly swollen, tender, and contained fluid), and the right wrist and elbow. The heart's action was frequent, the sounds normal; temperature 103°; pulse 128. Salicylic acid was ordered to be given in doses of seven and a half grains every hour for six hours.—6.30 P.M.: After having taken four powders, the pain in the joints was not quite so bad; perspiration not increased; heart sounds normal; pulse weak, 120; temperature 102.2°.—11.30: Seemed

comfortable; had slept soundly for three hours. Tongue furred, but moist; temperature 101.2°; pulse 100.

Feb. 3rd.—Perspired freely during the night. Had not been sick. Pain in legs somewhat increased on movement; tongue clean; bowels opened; temperature 99.8°; pulse 96.

4th.—Better; legs not painful, but stiff on movement; temperature 99.2°; pulse 90; heart-sounds normal.

5th.—Patient had a very restless night, but the pain in the joints was much less, and there was less stiffness; temperature 98.8°; pulse 84.

6th.—The salicylic acid was ordered three times a day. Patient quite free from pain; joints of normal size, not tender or stiff. Heart-sounds normal, appetite improving. Temperature 98.4°; pulse 80°.

7th to 14th.—Convalescence satisfactory, and she was discharged on the 14th, feeling quite well and strong.

CASE 2.—L. W.—, aged seventeen, a valet, was taken ill on Feb. 19th, remaining in bed next day on account of pain in his legs and swelling in his right knee. On admission on the 23rd the symptoms of acute rheumatism were well marked. The legs were drawn up and very painful. Temperature 103°; pulse frequent, artery large, full between beats; a grave soft-systolic murmur heard at apex of heart. Fifteen grains of salicylic acid ordered every hour for six hours. The first powder was taken at 6 P.M., the temperature at 5.35 being 102.6°; pulse 120°.—8.35: Temperature 102.4°; pulse 114.—10.30: Temperature 100°; pulse 110. By this time he was quite free from pain.

Feb. 24th.—Patient slept soundly and perspired very freely during the night. There was a little pain again in the right leg; bowels not open; tongue furred. Temperature 100°; pulse 108. At about 4 o'clock in the afternoon the powders were repeated for four doses. At 7 o'clock the temperature was 100.2°; pulse 110. At 10 o'clock the temperature was 99°; pulse 80°.

25th.—Patient passed a good night. Did not perspire much. Quite free from pain; bowels open. Still a slight murmur heard at apex. On being removed to the convalescent ward he left the chair in which he was being wheeled and ran to his bed. Appetite improving. Temperature 98.4°; pulse 84. Convalescence good.

CASE 3.—E. L.—, aged twenty-five, servant, had had two previous attacks of rheumatic fever. Ten days before admission she took cold. Her throat became sore, and she took to her bed on February 9th, and on the 13th she was attacked with severe pains in the arms and legs, accompanied by extreme tenderness; the knee-joints also became swollen and red, while the tongue was thickly furred and dry, and the bowels constipated.

On admission, on the 15th, all the above symptoms were well-marked. Temperature 101.6°; pulse 104.—At 10 P.M., temperature 102°; pulse 96. A Dover's power and an alkaline mixture were given, and an alum gargle was used for the throat.

Feb. 16th.—Patient did not sleep well, but perspired freely during the night; both legs and the left arm (especially at the wrist) painful, tender, and swollen; throat not so sore. Temperature 100.7°; pulse 100.—1.45 P.M.: Salicylic acid ordered in twenty-grain doses every hour for six hours, and an alkaline spray to throat.—2.45:

Temperature 101.6°; pulse 100.—4.40: Temperature 100°; pulse 92.—6.20: Temperature 100°; pulse 90.—7.40: Temperature 100.2°; pulse 96.—10.30: Patient in very little pain; throat easier since the use of spray. Inclined to sleep.

17th.—Patient slept well and perspired freely in the night; pain had left all parts except the wrist, but the limbs still felt stiff. Temperature 100°; pulse 96.

18th.—Throat quite well; tongue cleaning; patient stated that she has no pain whatever; had a good night's sleep; bowels not open. Temperature 99.4°; pulse 88.

19th.—Patient slept well; no pain or stiffness; less perspiration; appetite improving; urine normal, sp. gr. 1030. Castor oil ordered on account of the confined state of bowels. Temperature 99.2°; pulse 84.

22nd.—Patient has continued free from pain since the 19th, but the temperature was not quite normal until this morning. Temperature 98.4°; pulse 80.

23rd.—Patient not quite so well; complained of a severe headache, and also of feeling sick. Bowels constipated. Temperature 99.6°; pulse 100. Citrate of iron and quinine ordered to be given three times a day.

27th.—Some improvement till the afternoon of the 26th, when a decided relapse took place, with pain, swelling, and redness of wrist. Tongue thickly coated and dry. Temperature 101.4°; pulse 98. Salicylic acid was repeated in twenty-grain doses every hour for six hours.

28th.—Much better. Pain in wrist quite gone; perspired well after powders. Temperature 99.8°; pulse 90.

March 1st.—Patient not quite so well again. Complained of some pain in left wrist, which appeared somewhat swollen, and was painful to the touch. Temperature 99.8°; pulse 94. Appetite very poor. The salicylic acid was repeated in the evening in the same dose as before, but only for three hours. The patient slept well, and next morning she was quite free from pain. Bowels open; appetite not so good. Temperature 98.4°; pulse 84. Patient continued to improve, and left hospital quite well on the 10th.

CASE 4.—J. C.—, aged nineteen, general servant, fell ill about a month before admission, with some pain in the shoulder and right elbow. When admitted on Feb. 28th she was suffering from well-marked symptoms of rheumatic fever. The right arm was painful, and the wrist greatly swollen, red, and very tender. There was also some tenderness in lower extremities. The tongue was dry and furred. Temperature 102.8°; pulse 108; respiration 28. A loud friction-sound, intensified by pressure of the stethoscope, was audible. Six powders of salicylic acid, twenty grains each, ordered to be taken, one every hour. After the first powder the pain became much easier, but the temperature remained the same.—9 P.M.: Temperature 102.8°; pulse 110.—10.30: Temperature 102.4°; pulse 108.—11.45: Temperature 101.8°; pulse 112.

Feb. 29th.—Had a good night; perspired freely; was in very little pain; appetite improving. Continue broth diet. 8 A.M.: Temperature 99.8°; pulse 96.—8 P.M.: Temperature 100.8°; pulse 104.—10 P.M.: Temperature 101.8°; pulse 108. Powders repeated for three hours.—11 P.M.:

Temperature 100.2°; pulse 98.—12.10 A.M.: Temperature 98.6°; pulse 92.

March 1st.—Patient had slept soundly, and felt better; was in no pain, but there was some stiffness about the joints. Temperature 98.8°; pulse 96.—5 P.M.: A slight return of pain in wrist, so that the powders were repeated for four hours. Temperature 98.8°; pulse 84.

2nd.—Had a good night's rest, and was quite free from pain. There was a soft mitral systolic murmur heard at apex; skin moist; tongue clean; bowels open; appetite improving. Temperature 98.4°; pulse 68.

8th.—Convalescence went on well, patient feeling stronger daily. Was discharged a few days afterwards, temperature having been normal for over a week.

*Remarks by Dr. Broadbent.*—The cases reported speak for themselves, but it may be stated that they were all well-marked examples of acute rheumatism, and that two of them were of more than average severity. The results of the treatment of rheumatic fever by salicylic acid in the practice of Stricker, of Berlin, were so remarkable that the earliest opportunity was taken of bringing the drug to the test of experience. The mode of administration recommended by Stricker is that twenty to thirty grains be given every hour for six doses, but at the first trial at St. Mary's only seven grains and a half were given at each of the six hours, simply suspended in water. No bad effects being observed, the dose was increased. It was impossible not to be astonished with the effects, and notwithstanding the many disillusionations experience in medicine brings, not a few of which have been furnished by acute rheumatism, I should not do justice to my conviction were I not to say that apparently we have in salicylic acid, as Dr. MacLagan has said in his communication, a remedy for rheumatic fever comparable to quinine as a remedy for ague. According to present experience rheumatic fever when treated by this drug is an affair of two or three days. The disease is common enough, and its usual course sufficiently well known, so that no long time will be required to establish some definite conclusion, and to bring out any possible injurious effects. The only complaint hitherto made of the acid is that it is hot and irritating to the throat; given in milk vomiting has been produced.

Careful examination of the effects on the pulse, temperature, urine, &c., will no doubt yield important information. Mr. Sworder, who has watched the cases very closely, states that the temperature invariably rises for a short time after the administration of the first dose, but the observations recorded in the careful notes taken at short intervals by him and Mr. Gawith show a gradual fall both of temperature and pulse rate. No sphygmographic observations were made. Relief from pain was always quickly obtained, and, as a rule, the patients slept well, no opiate being required; as a rule, again, there was very free perspiration, but this of course is common in acute rheumatism.

# HOSPITAL FOR THE EPILEPTIC AND PARALYSED.

ON CASES OF EPILEPTIC SEIZURES WITH AN AUDITORY WARNING.

(By Dr. HUGHLINGS JACKSON.)

It is possible to mistake cases of Menière's disease (auditory vertigo) for cases of epilepsy. On the other hand, there is the possibility of taking certain cases of epilepsy to be cases of Menière's disease; for some epileptic seizures begin by a sound in the ear as paroxysms of auditory vertigo do. It is to be particularly noted that we speak, of course, of cases of epilepsy which *begin* by a sound or noise, and by one which is so definite that the patient gives it as the first symptom or warning of his seizures. This is a rare warning—one much less common than an "aura" of colored vision or even than one of smell. It is far less common than that strange feeling referred to, or near to, the epigastrium (solar plexus?) by many epileptics; the last-named "aura" is, Dr. Hughlings Jackson thinks, a crude development of certain of those sensations which Lewes calls "systemic" and Bain "organic." Dr. Jackson thinks the auditory is a sense akin to certain of the systemic sensations, and that too high rank in the intellectual scale is given to hearing. Although it may come next to sight, he thinks that it stands far below it. He believes that the anatomical substrata of words are motor (articulatory), as do Bain and Ferrier; but supposing them to be auditory, it is to be observed that the sounds of words serve only as symbols. Sounds, except as symbols, serve comparatively little in mental operations; most mentation, whether healthy or morbid, is carried on in visual ideas.

The several different sensory warnings we have mentioned should be studied methodically, with some reference to one another. The sensations we lump together as Systemic are, of course, exceedingly diverse and highly compounded. They are strangely neglected in the sense that they are not studied in their relations to other more special sensations. Dr. Hughlings Jackson believes all the senses (special, common, and systemic) are represented in the highest cerebral centres, chiefly in those of the posterior lobes. He thinks, however, that the more *special* the sense the more unequal is its bilateral representation, and that the right is the side of the brain in which the most special senses have the leading representation, the left the side where the systemic have the leading representation.

The following is a case in which an auditory warning preceded severe epileptic seizures. The notes of it were taken by Dr. Sturge, but what follows is only from part of them.

**Warning.**—This is well marked, and consists of a sound like a distant railway whistle; it was heard by the *left* ear, and as if coming rapidly nearer to her until it was very loud. Before mentioning an additional sensation which she had before losing consciousness, we are obliged to say that next time the woman was questioned she denied that she had said that the noise "came nearer." Hence we must hesitate in drawing analogies. But the "coming nearer," if it were so, may have depended on rising of pitch in the sound *simulating* "coming nearer." (If colored vision be an "aura" of an epileptic paroxysm, it

is, Dr. Hughlings Jackson has observed, as Falret had done before, *most often* red; it is the color of "lowest pitch" which is usually developed *first*.) The whistle of a rapidly approaching engine seems to rise in pitch, and this is generally explained by saying that an increased number of vibrations affect our ear in a given time (compare Huggins' method of determining speed of stars by spectro-scope). To return to the woman's case. The sound or noise lasted only for a "second," not long enough, she said, for her to lay herself down. It was "not like an ordinary singing in the ears" she had been subject to this, but it had ceased. The sound is paroxysmal, and is always followed by a fit. She says she has not noticed that she is temporarily deaf after the seizure. Another warning she has is that of a curious darting sensation across her eyes from right to left; this sensation she cannot describe. Its passing to the left, considering its association with the left-sided auditory aura, is possibly owing to the turning of her eyes to the left, as—so she says—the next thing after the visual sensation is that her head *seems* to turn to the *left*, the whole body seems to turn to the *left*, and then she becomes insensible. She cannot say whether there is any *actual* movement to the left or not. In migraine there is a true one-sided—a hemiopic-like—development of visual sensations, but it is possible that the woman's feeling of the passage of the visual sensation from right to left is owing to simultaneous turning of the two eyes to the left.

This is evidently a case of epilepsy; the patient bites her tongue, which shows that the paroxysms are severe. Further evidence of epilepsy is, that after the paroxysms she acts automatically before she regains consciousness. Dr. Sturge notes that she told him that "if the fit occurs in the day-time, she gets up and goes about any work that she was doing before her attack. Thus she has many a time found herself standing at the wash-tub washing linen, or sitting in a chair trying to sew." These facts almost alone would point to a prior epileptic seizure. Elaborate automatic actions are very common after epileptic seizures.

The turning of the head to the *left* (if her account is to be trusted) points, Dr. Hughlings Jackson thinks, to a "discharging lesion" of the *right* cerebral hemisphere—the auditory "warning" being the first symptom from the discharge. The precise localisations of the parts of the cerebral hemisphere where each of the senses is most represented will be greatly helped by the researches of Ferrier.

A highly intelligent and thoroughly well-educated young man, whose account is to be trusted, described epileptic seizures as beginning by an auditory "aura," which he spoke of as a "humming," and also as a "rushing." It gets louder and louder, but does not seem to come nearer, nor to alter in pitch. It always begins in the left ear, but may extend to the right ear. It becomes louder and louder as his head is turned round to the left. This sound does not always precede his paroxysms, but he says his head invariably *turns to the left*. The words he uses to describe this in his report are "the last thing he is conscious of is an attempt to look over his left shoulder; this is, of course, involuntary." In this case, as in that of the woman, the patient does things automatically when the paroxysm is over. He instances that having an attack when feeling a patient's pulse he,

on recovery in another room, began to feel the pulse of a female relative attending on him. He has shown more extravagant conduct after a seizure "trying to get out of the window," &c.

It is interesting to note that in this case also the head turns to the left, the sound being referred to the left ear. It is, Dr. Hughlings Jackson thinks, a matter of very great importance to note the side to which the head turns when there is any sensory warning, from the most special to the most systemic, for the side turned to points to the opposite side of the brain as that discharged. We should carefully note the facial aspect. Does pallor of the face or stoppage of pulse, or both, occur mostly at the onset in those cases in which the patient's warning is an epigastric sensation? (Does the pallor chiefly affect those parts of the body which blush most in healthy emotion?) To which side, if there be turning, does the head generally turn in cases where there is respectively an aura of colored vision, smell, sound, systemic (i.e., epigastric) sensations, &c.? Facts on these points would be some help towards determining the side of the brain in which particular sensations have the leading representation, or helping to show that there is no difference in their representation in the two sides, or that epileptic paroxysms throw no light on the matter. There are, however, few things less trustworthy than reports by patients or their friends as to the side to which the head turns at the onset of convulsive seizures. The facts of the second case we have related are, however, thoroughly trustworthy.

## ST. BARTHOLOMEW'S HOSPITAL.

### HEMORRHAGE INTO CEREBELLUM AND OTHER NERVOUS LESIONS IN A CASE OF HEART DISEASE.

(Under the care of Dr. ANDREW.)

For the following interesting and valuable notes we are indebted to Vincent Harris, M.B., house-physician.

F. D—, eight years old, a somewhat poorly-nourished boy, was admitted into Mark ward on Oct. 8th, 1875, for subacute rheumatism. His mother stated that he had had pains about him for a month before admission, with swelling of the left ankle and redness; that about a week after first seizure he had first complained of frontal headache, which had continued since, and latterly of dimness of vision. On examination, very slight swelling of the left knee, with little pain and no redness, was discovered. The heart was found to be hypertrophied, and a loud rasping double murmur was heard, most plainly at apex of heart. Pulse 108, full, soft, and regular; respiration 30; temperature 101° 6°.

The boy was kept in bed, and, no doubt on account of the rest, during the next few days got rid of a good deal of palpitation of heart, of which he had complained, and of his headache; but the latter was still severe. His temperature continued to be raised, and to vary between 101° and 102°, until the 18th, when it suddenly went up to 104°; his other symptoms corresponded, and he was decidedly worse; headache, principally frontal, was increased; the pupils unequally dilated, the left more than the right; capillaries of face, neck, and

thorax appeared distended; the abdomen was noticed to be retracted, and his bowels were obstinately constipated. About this period he commenced screaming out at nights, disturbing the patients in the ward. He said he screamed because of his headache. This continued off and on for many weeks. An ophthalmoscopic examination made of his eyes on the 25th showed that the discs were swollen (the right more than the left), dim, edges ill-defined and hazy, and the veins were large and tortuous, but no hemorrhages were detected.

There was no material change in his condition for some weeks. The principal points noticed during the time were that he was generally fairly cheerful in the daytime, but as night came on his head began to ache, and nearly every night he cried out a good deal; the veins over the temples became very plainly marked, and the venules of the cheeks were chronically congested. His pupils varied, but were generally dilated. He took food fairly, but vomited occasionally; his bowels had to be relieved by enemata. Once or twice there was tenderness over splenic region; enlargement of spleen with raised temperature, so that infarcts in the spleen were diagnosed. On Nov. 6th there was drawing of the mouth to the right and slight convergence of the eyes; whether there were other signs of facial palsy but the drawing of the mouth was not certain. He complained of feeling giddy, of dimness of sight, and also of buzzing in the ears. The discs on the 10th were more indistinct.

Nothing of importance was noticed until the early part of December, when it was thought that the condition was improved; at any rate, the boy did not seem so stupid and dull as he had been, his appetite was better, and he called out less at night. There seemed, however, to be more marked drawing of the mouth. He vomited excessively on the 4th and two following days.

On December 20th the discs were found to be swelled and bluish grey, outline blurred, vessels obscured in places. On the left side were some buff-colored effusions around the disc. The note of the day states that "he wets the bed nightly." Was found to be much worse on Christmas-day; had no fit, but gradually became semi-conscious, groaned while asleep, and passed his motions in bed. The next day took no notice of anybody, but put out tongue when asked loudly, and swallowed well. Pupils large, but equal. He remained much in the same state until the 31st. His temperature varied from 101° to 105°, and pulse from 120 to 150. It was then noticed that, in addition to the drawing of his mouth to the right, there was right external squint, and rigidity of the upper extremities. Whether there was paralysis of the lower extremities appeared doubtful, but all the excreta were passed in bed. On January 2nd unconsciousness was complete; the left upper and lower extremities began to swell (he was lying towards the left). The skin was noticed to be much pitted. Two days after, patches of purpura began to appear, and there was considerable bleeding from left ear. The purpura increased on the 5th and 6th, and was pretty general over the body. On the 6th his right leg swelled, and early on the morning of the 7th the patient died, no new symptom having appeared.

During the whole course of the case there was nothing abnormal about the urine, and when there was vomiting the tongue was fairly clean. At the latter end there was a good deal of cough and

catarrhal sounds in the lungs. As far as could be made out there were no other or different signs of nervous lesion. Whether sensation was impaired appears doubtful; it was not so long as *complete* consciousness remained. The heart-murmurs were loudly heard, even to the last.

*Autopsy, eight hours and a half after death.*

—Body much emaciated; several large purpuric spots on both legs, especially on inner surface, and largest on left leg; also a number of small milium hæmorrhages on chest and elsewhere.—Head: Calvaria thin; dura mater presented a normal appearance externally, but the inner surface covering the right hemisphere and lining the right middle fossa was discolored a brownish-yellow by old extravasation. Some increase of fluid in the brain. Over the right half of the cerebellum some soft, partly congealed blood, small hæmorrhages over both hemispheres, and a continuous patch of ecchymosis along the margin of right temporosphenoidal lobe; corpus callosum much arched; both ventricles greatly dilated and containing much fluid; substance of right hemisphere very greatly softened, also the corpus striatum and optic thalamus, more especially the former; a large, rather recent embolism in right middle cerebral artery at its entrance into Sylvian fissure; vessel at that point covered with a patch of recent lymph. Cerebellum softened and disorganised; a large hæmorrhagic cavity in right half, extending partly into left, had come to the surface on right side; the blood in it was semi-fluid and dark, the cavity, surrounded by yellow smooth-looking brain-substance, presenting a cellular structure microscopically, probably brain-substance discolored by blood-clot. No thrombus of sinuses or ruptured vessel, from which the blood came, to be found.—Heart: Small purpuric spots covering the peri- and endocardium; some hypertrophy of left side; mitral valves covered with masses of fibrinous vegetations, which hung down pendant-like into the ventricle, and extended up on the inner side of auricle. Aortic valves competent. Spleen adherent to peritoneum; about a dozen large, old, and recent hæmorrhagic infarcts. Liver soft, nutmeggy, peculiarly and regularly speckled with yellow spots. Kidneys with old and recent infarcts; structure fairly distinct. Purpuric spots on peritoneum and mucous membrane of intestines. Lungs rather solid from œdema, otherwise normal. Hæmorrhages under visceral pleura.

### MIDDLESEX HOSPITAL.

LARGE STRANGULATED CONGENITAL HERNIA; OPERATION, FOLLOWED BY SUPPURATION BETWEEN THE ABDOMINAL MUSCLES; RECOVERY.

(Under the care of Mr. GEORGE LAWSON.)

THE following case of strangulated congenital hernia presents some points of clinical interest. The hernia was very large, oblique inguinal, and congenital; the strangulation was very acute, and the progress of the case afterwards was exceptional. The wound of the operation was small, and over the neck of the sac; but some difficulty was experienced in returning the large quantity of bowel—about sixteen or eighteen inches—into the abdomen, as it appeared to be held by some con-

striction in the scrotum. Mr. Lawson therefore withdrew the whole of the protruded intestine from the sac of the tunica vaginalis, and then the reduction was easily accomplished. The patient at first progressed very favorably. All tenderness of the belly ceased after the operation; but on the second day the temperature rose to 102° 6', the pulse to 112, and the man complained of tenderness on the right side of the abdomen. The belly was flaccid, and the tenderness seemed to be confined to the abdominal walls. The high temperature and quick pulse, with tenderness on the right side, continued until the sixth day, when the symptoms were relieved by the escape of a large quantity of pus, which came from the wound when pressure was applied with the hand over the right iliac region. There was extensive suppuration between the abdominal muscles, and this accounted for the continued high temperature and pulse. On the following day the pulse went down to 98, and the temperature to 99° 2'. During the development of these symptoms the man had a wakeful, busy delirium, which closely resembled delirium tremens. The patient improved as soon as free suppuration was established, and has continued to do well. The amount of pus which escaped daily for many days was not less than from four to six ounces. He is now convalescent.

James C—, aged twenty-four, was admitted on Dec. 29th at three o'clock in the morning, with a large scrotal hernia of the right side, which he was unable to return. He had been ruptured all his life, and had worn a truss, which, however, did not prevent the hernia from frequently coming down; but up to the time of admission he had always been able to reduce it. Four hours before his admission, whilst straining at stool, the hernia descended, and this time it resisted all his endeavors to get it back, and as he began to feel some discomfort, he applied to the hospital for relief.

On his admission he was seen by the house-surgeon, who found a large scrotal hernia, not in the least tense, but rather tender, and as there were no other symptoms the man was placed in bed, with his pelvis raised. A full opiate was given by the mouth, and an ice-bag was placed over the tumour. The lower bowel was also emptied by means of an enema.

The man derived no benefit from this treatment, but symptoms of strangulation rapidly set in, and at nine o'clock the tumour was very tense and tender to the touch. There was pain in the abdomen with a sense of dragging and nausea. Mr. Lawson then saw the patient, and decided to operate at once. There was nothing special in the operation, except that after the division of the stricture there was some difficulty in returning the bowel, as it seemed to be held in the scrotum. Mr. Lawson accordingly drew out, as already stated, the intestine, about fourteen or sixteen inches, from the sac of the tunica vaginalis, and then it slipped back easily into the abdomen. The wound was closed and a pad and bandage applied. The belly was covered with a layer of cotton-wool, and he was ordered half a grain of extract of opium, which was to be repeated every two or three hours if in pain. After the patient had recovered from the ether, he expressed himself greatly relieved by the operation.

Jan. 8rd.—The patient passed a good night, but complained of pain on right side of abdomen. The belly was quite flaccid. The temperature and



pulse had risen; pulse 112; temperature 102° 6'. To go on with the opiate pills.

The patient continued in much the same state, with a high pulse and temperature, until Jan. 4th, when there was a large escape of pus from the wound, evidently from extensive suppuration between the abdominal muscles.

Jan. 5th.—Much better. The tenderness was greatly diminished. Pulse 96; temperature 99° 2'. The discharge very free from the wound.

6th.—The bowels acted well without medicine. The discharge still continues very copious on pressure with the hand over the right iliac region.

30th.—The man has progressed favorably since last report. The discharge has ceased, and he is convalescent.

The patient has since left the hospital quite well.

### HOPITAL TEMPORAIRE, PARIS.

COMPLETE OBLITERATION OF THE SUPERIOR EXTREMITY OF THE PHARYNX; OPERATION; APPLICATION OF AN APPARATUS IN ORDER TO MAINTAIN AN OPENING.

(Under the care of M. LUCAS CHAMPIONNIERE.)

PROFOUND lesions of the pharynx are not rare after chronic sore-throats, and have of late been the subject of special study. Syphilitic and scrofulous disorders of this organ have also been treated of by various authors; but there is a form of lesion which is still very little known, and that is the complete obliteration of the posterior orifices of the nasal fossæ. The following observation gives a fair idea of the disease, and of the difficulty of its treatment. The application of a new operative method makes it specially interesting.

A milliner, aged nineteen, presented herself at the hospital, in June, 1876, complaining of being able to breathe only by the mouth. She was unable to blow air through the nose, and was extremely deaf. The senses of taste and smell had been completely lost. When she talked it was difficult to understand her. When she was twelve years old she was subject to sore-throat, which lasted a long time; and, little by little, she began to feel a great difficulty in breathing. Upon local exploration, the soft palate was found to adhere to the superior extremity of the pharynx. The wall of the pharynx seemed to be drawn forward. The posterior pillars were no longer prominent, and were united to the wall of the pharynx. Upon the median line there were the remains of the uvula. All these parts were of a deep-red color. It was extremely difficult to touch these parts, as they were very sensitive; it was, however, easy to feel that there was there a considerable thickness of tissue, and on passing a sound through the nose it was not possible to feel it from the mouth. The general health of the patient was satisfactory, and there was no history of syphilis.

The patient was put under a treatment consisting of bromide of potassium, in order to render the throat less sensitive, and the operation was performed on July 23rd, 1876. After some very laborious operative manœuvres, and with the aid of a few incisions, M. Lucas was enabled to pass a Belloe's sound into the mouth through the nose. The orifice thus obtained was then enlarged on

either side. Two india-rubber tubes were introduced through the nasal fossæ, and were passed through the aperture in order to keep it from closing.

Three weeks later the tubes were withdrawn, and the patient was able to smell and taste; her hearing had considerably improved also. She then left the hospital, highly satisfied with the results of the operation. The amelioration unfortunately was not of long duration, and at the end of September she returned to consult M. Lucas.

The obliteration was, if anything, more complete than before, and all the symptoms had reappeared. M. Lucas decided upon performing a second operation, and this time to make a much larger opening than before. On the 23rd October the patient was operated on for the second time. An incision was made in the median line of the soft palate, which was prolonged to the posterior wall of the pharynx. Then, with the aid of curved scissors, two strips were taken off the sides, and a large orifice was thus obtained. Three silver sutures were placed in the palate, and tubes were passed as before in order to prevent the closing of the wound. The first two or three days after the operation the patient had a little fever, and the face was considerably swollen. However, these symptoms soon subsided, and three weeks after the operation the tubes were withdrawn, and the wound was completely healed. The hearing and taste returned with the power of smell; the speech was still a little indistinct, and, at times, she passed her food back through the nose in trying to swallow it. A small apparatus, made by M. Collin, was then adapted to the opening. It consists of a silver tube with two branches, which are fixed on to the last molar tooth on either side. It is very light and easily adapted, the patient putting it in and taking it out herself.

The results of the operation this time have been most satisfactory. The patient is able to blow through the nose and to breathe freely. She tastes her food, and is able to smell perfectly well. This condition has maintained itself to the present date, and the patient continues to report herself every week at the hospital. M. Lucas, however, is of opinion that the patient will never be able to leave off the small apparatus without fear of a reproduction of the obliteration. It is even possible that her present apparatus may have to be changed for a more perfect one, as with this one her voice has a strong nasal intonation.

### GUY'S HOSPITAL.

SCARLATINAL DROPSY; CONVULSIONS; VENESECTION; RECOVERY.

(Under the care of Dr. WILKS.)

For the notes of the following interesting case we are indebted to Mr. John Rendall, house-physician, who conducted the treatment of the case.

F. M.—, a girl aged seven, was admitted on Jan. 21st with general dropsy. Her father had dropsy when fourteen years of age, but the mother had always been healthy. There was no history of rheumatism in the parents or in the patient, but it had been noticed that from birth the girl was cyanotic, especially after any physical exertion.

Four years ago she had measles, and she had always been a delicate child.

On Dec. 28th, 1875, she was attacked with scarlet fever, and on Jan. 22nd she left her bed-room for the first time, and on the evening of the same day her eyelids swelled. After this the dropsy gradually extended over the whole body, in which condition she was admitted.

On admission the countenance was swollen, pale, pasty, and cedematous, and the lips were blue; the legs, arms, and abdomen were also swollen; the fingers were bloodless, the tips blue; there was distinct fluctuation and gravitation of fluid in the abdomen; the tongue was covered with a white fur; there was no evidence of desquamation except a slight scaling between the thumb and forefinger of the left hand. Loud rhonchi, sibilant and moist sounds, were heard all over the chest, both anteriorly and posteriorly. The precordial dulness could not be distinctly made out, but there was dulness extending from the second rib downwards a little to the right of the median line, and also to a line drawn from the apex of the axilla downwards. A thrill was felt in the left second interspace, and a loud systolic murmur was heard in the second left intercostal space, as well as in the axilla and at the back, but loudest just over the pulmonary valves, running along the pulmonary artery up to the axilla. Urine: specific gravity 1018; half albumen; no blood; hyaline and epithelial casts. Ordered ten grains of compound jalap powder at once, and half an ounce of the acetate of ammonia mixture every six hours.

At 8.30 p.m. the patient was seized with convulsions, most marked on the right side of the body, while the head and eyes were inclined to the right side. The spasms were mostly of a clonic nature, and there was rigidity of the muscles of the neck. There was foaming at the mouth, but the tongue was not bitten, although the teeth chattered, and there were convulsive movements of the muscles of the face. The pupils were slightly dilated, the conjunctivæ almost insensible, the breathing loud almost stertorous, and the face livid. These fits were frequently repeated, and during the intervals the patient was quite unconscious. A warm bath was administered, with no good result. As the convulsions continued, and increased in intensity, venesection from the median cephalic vein to three ounces was practised whilst the patient was in the bath, but there was no cessation of the convulsions. Temperature 102°; pulse 90.

Chloroform was administered, and the convulsions ceased, and the patient was quiet till ten o'clock next morning (Jan. 28th), when the fits occurred a second time. Venesection to five ounces was done, with great relief, the convulsions ceasing in ten minutes, and not occurring again, the patient making a gradual recovery. During the fits the breathing was suspended for some seconds, after which it resumed its former character.

Jan. 30th.—Patient sensible. Pulse 70; less dropsy about abdomen; lower eyelids still cedematous; urine, albuminous one-third; specific gravity 1020.

Feb. 6th.—Urine: slight cloud of albumen; no casts. Patient is rapidly improving, and all the dropsy has disappeared. Bruit still the same.

12th.—No albumen in urine.

18th.—Got up for the first time.

26th.—Left the hospital cured.

## HOPITAL ST. LOUIS, PARIS.

### SARCOMA OF THE ABDOMEN; RECOVERY.

(Under the care of M. PÉAN.)

H. R.—, aged twenty-two, married, and mother of three children, said that in the month of June of last year she had noticed a swelling about the size of a walnut, situated in the region of the left anterior and superior spine of the ilium. She continued to work as usual, and did not suffer in the least. Her appetite remained good, and she did not think that she had grown thinner. In the month of November last she was confined for the last time, and her courses returned five weeks after, and have never ceased to be regular; heart and lungs normal. The father of the patient is still alive, and upwards of sixty years of age. Her mother died at the age of fifty of ovarian dropsy. No history of syphilis.

On admission, the patient had a fair complexion, was of a lymphatic temperament, and appeared well-nourished. She ate and digested well. She had no edema of the left leg. She did not suffer in the least. Upon examining the abdomen it was easy to detect a large tumour, situated to the left of the median line, which projected over the superior part of the thigh. It was limited by a line passing through the umbilicus above, and below it extended down to the groin. It was of an ovoid shape, and seemed to be adherent to the spine of the ilium. The hand could easily be passed underneath it. Movements of all sorts were possible at the internal extremity of the mass, but outside it appeared to be adherent. The skin rolled easily over it. The uterus was movable, and the inferior extremity was turned towards the left.

Feb. 19th.—The patient was operated on by M. Péan. A curved incision, passing above the groin, was made to extend through the skin, the cellular tissue, and the muscles. The tumour was then laid open, and the enucleation performed by breaking down some slight adhesions with the peritoneum at the external extremity, as well as at the spine of the ilium. The peritoneum was left untouched during the whole operation. The two edges of the wound were then brought together by a wire suture.

20th.—The patient slept all night, and appears in excellent spirits this morning; does not suffer in the least. Temperature, 37.2° Cent. (morning), 38.2° Cent. (evening); pulse 108.

22nd.—The patient continues to sleep well, but complains of a feeling of sickness this morning. The abdomen, however, is not sensitive to the touch, nor has she any headache. Temperature, 37.4° Cent. (morning), 38.2° Cent. (evening); pulse 114.

25th.—The feeling of sickness has disappeared; the patient begins to have some appetite. The wound has healed by primary intention at the inner part, where there is no drainage-tube; there is a slightly red blush around it. Temperature 37° Cent.; pulse 96.

28th.—Wound looking very healthy; hardly any discharge. The silver wires are taken off to-day. Nearly the whole length is healed. Temperature and pulse normal.

March 6th.—The patient is thoroughly convalescing, and is about to leave the hospital for the country.

Upon putting a portion of the tumour under the microscope, it was found to be a sarcoma of the fascicular kind. The rapidity of its growth and its existence in so young a person are both points of great interest. Another noteworthy fact in the case is the apparent good health of the patient, and the fact of her being confined without any accident whilst bearing a tumour, which was about the size of the head of a foetus.

## Medical Annotations.

"Ne quid nimis."

### THE INOCULABILITY OF DIPHTHERIA.

UNTIL a comparatively recent period it has been generally considered that diphtheria could not be inoculated directly, either in man or the lower animals. This view, however, must be allowed to have been somewhat contradictory to the well-known fact of the conveyance of the contagion of diphtheria by means of pieces of false membrane, and to such cases as those of Professor Valleix and of Herpin and Gendron in France, and other similar cases in England. The belief was grounded on the negative results of some experiments on himself by Trousseau, and also more especially by Peter. The results of these experiments seem to have been accepted far too readily as evidence of non-inoculability of this disease. It should be borne in mind that a large number of experiments under varied conditions must all equally lead to a negative result before a belief in the non-occurrence of any given result can rightly be entertained; and even then a single positive result outweighs all the negative ones. In fact, the experiments of Trousseau and Peter were quite inconclusive. Trousseau dipped a lancet into some false membrane recently expectorated, and made punctures with it on his arm and on the velum palati. Peter made three experiments: in the first he allowed a small piece of false membrane, coughed up during tracheotomy, which lodged in his eye, to remain there without attempting to wash it out; in the second he scraped his soft palate and tonsils with a pair of pincers in which was held a piece of false membrane recently coughed up; and in the third, he inoculated a puncture of the mucous membrane of his lower lip with diphtheritic exudation. Of these somewhat foolhardy experiments only two can be considered as at all likely to have succeeded, and it is scarcely necessary to observe that scores of similar cases of escape from apparently certain infection with animal poisons might be cited, which yet only prove that there is a possibility of failure in the experiment. On the other hand, there is now abundant evidence that diphtheria can be inoculated, even in the lower animals. Thus Trendelenburg made experiments on pigeons and rabbits during an epidemic, and succeeded, in 11 out of 68 experiments, in producing diphtheritic false membranes in the larynx by placing in it pieces of recent exudation. Oertel even states that he has succeeded in nearly every case in inoculating rabbits; but in many cases blood-poisoning, rather than true diphtheria, seems to have been produced. Some experiments

have recently been made on rabbits by Dr. Gabriel Duchamp. From his results he concludes that the false membranes, when placed in the larynx and trachea of the rabbit, may give rise to a true diphtheritic process, whilst, in the absence of false membranes, the other products from the human larynx in a case of diphtheria did not appear to give rise to it, although they were very poisonous. The injection of diphtheritic exudation suspended in water into the subcutaneous cellular tissue, or into the jugular vein, gave rise either to no results or to septicæmia or pyæmia; and inoculations of the skin with false membrane were equally without result both in the rabbit and the horse. The number of experiments was, however, too limited to allow of our accepting these negative conclusions in an absolute manner. The subject is one of considerable importance, from its bearing on the mode of conveyance of the contagion of diphtheria; so far as experiments go at present, they would seem to show that the primary contagion is local, and that its effect depends on the existence of certain conditions of the mucous or other surfaces favorable to its reception, which is entirely in accordance with clinical experience. The existence or non-existence of fungus in the false membranes, and its dependence upon their presence is, it need hardly be said, an entirely different question.

### EPIDEMIC PNEUMONIA.

THE points of resemblance between the clinical history of acute pneumonia and that of acute general diseases give considerable interest to the occasional epidemics of pneumonia of which records exist. They have been for the most part described by older writers, but some recent outbreaks are alluded to by Dr. Sturges in his recent monograph on pneumonia. One of these occurred in Iceland in 1863, of great severity. It has been carefully described by Hjætelin. Another epidemic occurred at New Brunswick in the 22nd Regiment in 1867. Griesinger pointed out the relation pneumonia seems sometimes to bear to malarial influences, and at a recent meeting of the Académie de Médecine a further contribution to our knowledge on the subject was made by Dr. Bourgade, who read a paper "On Intermittent Broncho-Pneumonia." His conclusions were that remittent or intermittent broncho-pneumonia is frequently observed in the central region of France, and that it should properly be regarded as an imperfectly developed form of paludal fever. It is characterised by a remittent pyrexia, with special congestive phenomena in the bronchial tubes and the lungs. It differs from ordinary pneumonia by the varieties in the seat and succession of the physical signs, by its irregular course, and especially by the periodical appearance every day or every third day of an accession of fever, in which the temperature suddenly rises, several degrees of defervescence occurring suddenly after a certain number of hours. No other remedy is required than sulphate of quinine; This, given as soon as possible after the commencement of the disease, cures it without special local treatment.

## DEVELOPMENT OF UNFECUNDATED OVULES.

SEVERAL observers have noted the occasional partial development of ovules which have not been exposed to the possibility of fecundation. The fact was mentioned by Bischoff and R. Leuckart, and M. Moquin-Tandon has recently communicated some analogous and more detailed observations to the Académie des Sciences. The first phases of segmentation were distinctly observed in the egg dropped by a female frog which had been kept in confinement for about four months, and secluded from all possible intercourse with the male. In the ovule, first two large vertical fissures were seen, and then an horizontal fissure. The segmentation then proceeded in a less orderly way, the vitelline spheres multiplying irregularly and becoming of unequal size. The process was more rapid than in fecundated eggs which were allowed to develop at the same temperature. Only a small number of the ova presented this evidence of commencing development; the majority died without any sign of segmentation. In all cases the phenomena soon ceased, the spherules produced separated, and the whole mass began to decompose. Sometimes death occurred after the division into two or four segments, sometimes at a more advanced period, but the ovule never assumed the mulberry look. M. Moquin-Tandon points out that the observation establishes incontestably that the ova of vertebrata not impregnated by spermatozoa may pass through the earliest stage of development in certain conditions the exact nature of which is at present unknown. These facts may be placed beside those of the same kind observed by Bischoff on the sow, by Hensen on the rabbit, by Agassiz and Burnette on fish, and especially with the remarkable fact observed by Oellacher that in fowls kept far from a cock unfecundated eggs underwent segmentation in the interior of the oviduct.

## TAPPING OF THE PERICARDIUM.

M. HENRI ROGER has brought before the Academy of Medicine of Paris an able report upon a case of this kind, sent to the Academy by M. Chairon. M. Roger first stated that he had had occasion to perform this operation upon three children affected in the same manner as M. Chairon's patient. The latter was a young artilleryman, who had gone through the war of 1870, and was admitted into the Convalescent Hospital of Vésinet, near Paris, in July, 1872. He had been ill about seven weeks, had still diarrhoea, had coughed a good deal, and was looked upon as suffering more from tuberculosis than from any cardiac affection. A pleuritic effusion of the left side was soon so palpable that tapping of the pleura by Dieulafoy's instrument was resorted to. This brought away about fifty ounces of serum. No improvement followed, and M. Chairon decided upon tapping the pericardium. This was done with the same apparatus, and brought away two pints of reddish serum. The patient was considerably relieved; but the cavities soon refilled, and death occurred seven weeks after the last operation. The lungs were studded with tubercles, the pleura contained about a quart of fluid, and the pericardium was enormously distended, and occupied by about two pints of pus. False membranes were very numerous, and almost one-third of an inch thick. It was shown that the

operation had been well performed, but that it could be only of a palliative nature. M. Roger considers that pericardial effusion must not be viewed like pleuritic dropsy; for in the former phenomenon we should consider two points—the size of the effusion, and the urgency of the symptoms.

## THE EFFECT OF COLD ON MILK.

THE effects of a low temperature on milk have been carefully examined by M. Eug. Tisserand, who recently communicated his observations to the Académie des Sciences. He found that, if cow's milk is immediately, or soon after being drawn, placed in vessels at various temperatures between freezing-point and 90° F., and the initial temperature is maintained for twenty-four or thirty-six hours, it will be found that the nearer the temperature of the milk is to freezing-point the more rapid is the collection of cream, the more considerable is the quantity of cream, the amount of butter is greater, and the skimmed milk, the butter, and the cheese are of better quality. These facts, he believes, may be explained by Pasteur's observations on ferments and their effect on the media in which they live. It is probable that the refrigeration arrests the evolution of the living organisms which set up fermentation, and hinders the changes which are due to their growth. The facts stated indicate room for great improvement in the methods of storage and preservation of milk. To keep milk at its original quality extreme cleanliness and a low temperature are absolutely necessary. In the North of Europe, Denmark, &c., the value of cold is already recognised, and in warmer climates the need for its assistance is greater. There is nothing impracticable in the suggestion, since running streams can be used to aid refrigeration. Where the quality of the milk is of great importance, ice may be employed.

## THE TREATMENT OF TAPEWORM.

A RETURN of the quantity of the several drugs in most general use for the treatment of tapeworm, in the public hospitals of Paris during the last ten years, has been made by the Director of the Central Pharmacy. A comparison of the relative quantities consumed during the first and second halves of the decennium supplies an interesting indication of the professional verdict as to their relative value. The average quantity of kousso consumed annually was more than twice as great during the four years since 1870 as during the six years before. The amount of pumpkin-seeds employed has not quite doubled; that of pomegranate-bark has remained almost stationary; and that of the male-fern has more than doubled. Kousso and male-fern thus appear to be the remedies on which Parisian experience shows most reliance can be placed. M. Collin, however, in a recent paper on *Tænia* in the French Army, advocates very strongly the use of pomegranate-bark. He asserts that when the precaution was taken never to administer a purgative before the vermifuge, the head of the worm was expelled, in three cases out of four, by a single dose. A purgative given before simply tears away the segments, leaving the head attached, and the head is then undisturbed by the special medicine.

## THE EFFECT OF PROLONGED MUSCULAR EXERCISE ON THE SYSTEM.

By F. W. PAVY, M.D., F.R.S.

THE recent pedestrian feats at the Agricultural Hall have afforded me an opportunity of investigating the effects of prolonged muscular exercise upon the system, and in compliance with the desire expressed I have pleasure in furnishing for publication in *THE LANCET* an account of the results observed.

In the first performance Mr. E. P. Weston, the renowned American pedestrian, undertook to walk 115 miles in twenty-four consecutive hours, and in response to his challenge Perkins, celebrated amongst English walkers as having accomplished a walk of eight miles within an hour, started as a competitor.

The walk was commenced on the evening of February 8th. Two tracks, situated alongside each other, had been measured out and assigned to the two pedestrians. Weston's track was covered with a mixture of loam and gravel, whilst in that of Perkins the boarded floor was uncovered. Weston wore thick-soled but light boots with a shallow heel, laced up in front and reaching above the ankle. He was in knickerbockers, and over his legs he had shining leather leggings kept in position by elastic metal bands above and below. Perkins was in ordinary athletic costume, with thin slipper-shoes. Weston is a spare man, thirty-seven years of age, 5 ft. 7½ in. high, and weighing, as a subsequent examination showed, a little under 10 stone. Built with a broad pelvis, the chief movement in walking is from the hip-joint, a swing being given to the body by the movement of the shoulder. The foot is carried only just sufficiently high to clear the ground, and but little motion occurs in the ankle and knee joints. The muscles at the upper part of the thigh are well developed, but the legs and feet are small, and the skin of the sole hard and thin. Perkins is a man twenty-three years of age, 5 ft. 5 in. high and 9½ to 10 stone in weight. His form of walking is perfection. Every muscle of his body seems to be brought into action. Free movement occurs at the ankle and knee, as well as hip. His leg is raised and carried forward with a long stride. The effect is good, but as in the case of a high-actioned horse, it is evident that it must tell considerably upon the feet and legs.

Starting at 25 minutes past 9, Perkins showed himself to be much the quicker walker of the two, but the trial was one of power of endurance, and not of speed. At 3 A.M. (Feb. 9th), Perkins stopped for 25 minutes, and partook of food. His feet till then had not materially suffered, but soon after resuming his walk they began to pain him, and it was deemed advisable to change his shoes for lace-up, canvas, heeled boots. The difficulty now gradually grew greater and greater, and becoming more and more footsore, he was compelled to give in at 10 minutes to 12, after accomplishing a distance of 65½ miles. When I saw him at 2.30, he was not only footsore, but otherwise knocked up. He had vomited after his meal at 3 A.M., and again after giving up, and he was lying in front of a fire in a private room of the establishment. His pulse was 102, feeble and irregular; the heart-sounds were normal. Temperature of the mouth

100°6°. The pads of his heels were hot, swollen, and tender. It is here that his feet more particularly suffered. Weston meanwhile kept walking on, but about 2 P.M. rested for a short time distressed with temporary exhaustion. The state of the atmosphere was such, it being a foggy, oppressive day, that it was scarcely to be wondered his exertion should prove unusually trying. For a time it appears he felt sick and giddy, but afterwards reviving, walked with strength and alacrity until the completion of the twenty-four hours, when he had accomplished a distance of 100½ miles. On reaching home he conversed freely, and appeared but little muscularly tired. His pulse was steady and firm, at first 100, and then lower. The heart-sounds were normal. The temperature of the mouth 97°6°. On the removal of his boots the only effect visible upon his feet was some vesicles in the neighborhood of the toes. These he punctured himself with a needle with a perfectly steady hand, and then plunged his feet for a few minutes into salt and water. The following morning he was up and about before people generally were stirring.

The food taken by Weston during the walk was mainly of a liquid nature, consisting of beef-tea made from Liebig's extract, yolks of eggs, jelly, sea-moss farina (an American preparation), coffee, tea, milk, sugar, and towards the end of the walk a little champagne, and brandy much diluted with water. To economise time he did not stop to take it, but consumed it whilst walking on the track in small quantities at a time and frequently.

Perkins took nothing after starting at 9.25 P.M. till 12.35 A.M., when he had two eggs beaten up in a large glass of sherry. At 3 A.M. he stopped and partook of a large loin mutton-chop and a pint of Burton ale. About half an hour afterwards he vomited, and apparently threw up all he had taken. At 4 A.M. he had some coffee-and-brandy; at 6 A.M. a glass of sherry; at 7 A.M. coffee-and-brandy; at 8.44 A.M. part of a mutton-chop, toast, and a cup of tea with an egg beaten-up in it; at 10.80 A.M. a cup of beef-tea; at 11 A.M. the same, and also at 11.80 A.M. Between 10.80 and the time of leaving off at 11.50 A.M. he also partook of small pieces of jelly at intervals. Soon after 12 he vomited a second time, and threw up the meat he had taken a little before 9, and looking in the same state as when it had been swallowed. From the time of leaving off till the completion of the twenty-four hours he consumed four yolks of eggs beaten up with water, and about a quart of freshly-made beef-tea.

I had made arrangements for the whole of the twenty-four hours' urine to be saved of each pedestrian for examination. This was successfully carried out in Perkins' case, but in that of Weston, through inadvertance on the part of one of the attendants, slops were thrown into it, and it was rendered useless for analysis. In the absence of the collection of the urine for the twenty-four hours, I thought the next best step was to obtain, for examination, the first portion passed after the completion of the walk, and it was about an hour after the period that this was done.

The following are the results of the examination conducted:—

*Perkins' urine passed during the twenty-four hours.*—Amount, 2047·7 c.c. (3 pts. 12 oz. 1 dr.); specific gravity 1027·48; free acidity, reckoned as oxalic acid, 1·79 grammes in 1000 c.c.

(.787 grain in 1 oz.); turbid from lithates. The microscope revealed the presence of the amorphous lithate of soda, with a few crystals of oxalate of lime. Composition in 1000 parts:—

|                       |     |     |            |
|-----------------------|-----|-----|------------|
| Water                 | ... | ... | 945.50     |
| Organic constituents— |     |     |            |
| Urea                  | ... | ... | 39.22      |
| Uric acid             | ... | ... | .59        |
| Other organic matters | ... | ... | 4.94       |
| Mineral constituents— |     |     |            |
| Chlorine...           | ... | ... | .89        |
| Sulphuric acid        | ... | ... | 3.11       |
| Phosphoric acid...    | ... | ... | 3.60       |
| Soda                  | ... | ... | 1.12       |
| Potash                | ... | ... | .78        |
| Lime                  | ... | ... | .49        |
| Magnesia              | ... | ... | .06        |
| Loss                  | ... | ... | .11 — 9.75 |

1000.00

Total quantity of solids excreted during the twenty-four hours:—

|                    |     |                                |
|--------------------|-----|--------------------------------|
| Urea               | ... | 82.52 grammes (1273.48 grains) |
| Uric acid          | ... | 1.25 „ (19.29 „ )              |
| Other organic mat- | ... | ...                            |
| ters               | ... | 10.88 „ (160.18 „ )            |
| Chlorine...        | ... | .82 „ (12.84 „ )               |
| Sulphuric acid     | ... | 6.55 „ (101.08 „ )             |
| Phosphoric acid    | ... | 7.78 „ (120.06 „ )             |
| Soda               | ... | 2.85 „ (36.86 „ )              |
| Potash             | ... | 1.64 „ (25.81 „ )              |
| Lime               | ... | 1.04 „ (16.05 „ )              |
| Magnesia           | ... | .18 „ (2.00 „ )                |

*Weston's urine passed one hour after completion of walk.*—Quantity 113.4 c.c. (4 oz.); specific gravity 1028.96; free acidity, reckoned as oxalic acid, 1.687 grammes in 1000 c.c. (.738 grains in 1 oz.); dark straw color, with pretty copious mucoid deposit; albuminous to a moderate extent. Microscopic characters: an abundance of hyaline and granular casts of tubules, many with nucleated cells visible; a few crystals of oxalate of lime; granular exudation cells, and flattened epithelial particles. Composition in 1000 parts:—

|                 |     |     |       |
|-----------------|-----|-----|-------|
| Urea            | ... | ... | 37.63 |
| Chlorine...     | ... | ... | .48   |
| Sulphuric acid  | ... | ... | 2.50  |
| Phosphoric acid | ... | ... | 2.68  |
| Total solids    | ... | ... | 50.40 |
| Ash             | ... | ... | 7.04  |

*Urine passed by Weston at 3 P.M. February 15th.*—Quantity 126.17 c.c. (5½ oz.); specific gravity 1025.38; free acidity, reckoned as oxalic acid, .96 grammes in 1000 c.c. (.42 grains in 1 oz.); bright amber color and clear. Microscopic examination revealed the presence only of a few crystals of uric acid. Composition in 1000 parts:—

|                 |     |     |       |
|-----------------|-----|-----|-------|
| Urea            | ... | ... | 25.61 |
| Chlorine...     | ... | ... | 3.74  |
| Sulphuric acid  | ... | ... | 1.67  |
| Phosphoric acid | ... | ... | 1.46  |
| Total solids    | ... | ... | 45.84 |
| Ash             | ... | ... | 16.60 |

This completes the observations bearing on the first performance. The unnatural condition of Weston's urine passed after his walk shows that albumen and casts of tubules may be made to appear through a general influence. There were no blood-corpuscles perceptible. In his subsequent

mercuric nitrate, and Davy's method, with the hypo-bromite solution, and the results were found to agree within a fraction with each other. As regards the saline constituents of the urine, a comparison of that passed under the influence of the exercise with the ordinary state shows a marked deficiency of the chlorides, and a notable excess of the sulphates and phosphates.

At 9.45 P.M. on Feb. 15th Mr. Weston started on his second walk at the Agricultural Hall, purposing this time to accomplish 180 miles in forty-eight consecutive hours. His pulse whilst quietly at rest at 3.45 in the afternoon had been 72, and the temperature of his mouth 99° F. His weight

at starting in his walking costume was 137½ lb. The track at commencing, on account of the admixture of too much gravel with the loam, allowed his feet to slip, and, not only retarded his progress, but somewhat strained his legs. He, however, got over a distance of 100 miles in the first twenty-four hours, and accomplished the remainder and about a third of a mile within the allotted time. He continued walking throughout the night of the 16th.

At twenty minutes to 12 on the night of the 16th he retired to a private room belonging to the hall, where a bed had been prepared for him. At this time his pulse was 84, and the temperature, taken in the mouth, 98.8°. He slept soundly, and resumed walking at 3.27 A.M. At the completion of the walk he weighed (in the same clothes as at the commencement) 133 lb. He had thus lost 4½ lb. during the forty-eight hours. No evidence of distress was upon this occasion perceptible. He appeared active and cheerful, and, ascending into the judges' stand, made an appropriate expressed wish in which his tongue moved as nimbly as his hand had previously done. On reaching home his pulse, in accordance with the usual practice, were taken for about seven minutes in a strong solution of salt and water with the chill off. At this time his pulse was 94, and the temperature of his mouth 97.6°. Resting for a short time upon the couch, he then went to bed without manifesting any sign of disturbance, and was about as usual the next morning.

Subjoined is an account of the food taken, according to the information supplied by the attendant, and of the examination of the urine.

*The first twenty-four hours of Weston's forty-eight hours' walk. Distance walked 100 miles.*—Amount of urine passed 2186.6 c.c. (77 oz.); specific gravity 1027.98. Free acidity, reckoned as oxalic acid, 2.8 grammes in 1000 c.c. (1.007 grains in 1 oz.). Clear dark-amber color. Microscopic characters: A few uric-acid crystals. Composition in 1000 parts:—

|                                  |     |        |
|----------------------------------|-----|--------|
| Water                            | ... | 940.89 |
| Solid residue (dried at 240° F.) | ... | 59.61  |

Incinerated residue ... 14.72

**Organic constituents—**

|                       |     |             |
|-----------------------|-----|-------------|
| Urea                  | ... | 83.65       |
| Uric acid             | ... | .58         |
| Other organic matters | ... | 10.71—44.89 |

**Mineral constituents—**

|                 |     |           |
|-----------------|-----|-----------|
| Chlorine...     | ... | 1.00      |
| Sulphuric acid  | ... | 2.58      |
| Phosphoric acid | ... | 3.79      |
| Soda            | ... | 1.90      |
| Potash          | ... | 5.05      |
| Lime            | ... | .07       |
| Magnesia        | ... | .08       |
| Loss            | ... | .27—14.72 |

59.61

Total quantity of solids excreted during the twenty-four hours:—

|                       |     |                                 |
|-----------------------|-----|---------------------------------|
| Urea                  | ... | 75.656 grammes (1167.52 grains) |
| Uric acid             | ... | 1.202 " (18.59 " )              |
| Other organic matters | ... | 24.424 " (376.91 " )            |

|                   |     |                              |
|-------------------|-----|------------------------------|
| Chlorine          | ... | 2.261 grammes (34.89 grains) |
| Sulphuric acid... | ... | 5.882 " (90.77 " )           |
| Phosphoric acid   | ... | 8.527 " (131.58 " )          |
| Soda              | ... | 4.120 " (63.72 " )           |
| Potash...         | ... | 11.848 " (175.67 " )         |
| Lime              | ... | .153 " (2.36 " )             |
| Magnesia          | ... | .196 " (3.024 " )            |

*Food consumed.*—Feb. 16th: 1 A.M., tea about 3 fluid oz.; 1.30 A.M., beef-tea about 3 fluid oz.; 2.30 A.M., yolk of egg; 3 A.M., yolk of egg; 3.45 A.M., tea about 8 oz.; 4.15 A.M., yolk of egg; 5.15 A.M., beef-tea about 8 oz.; 5.45 A.M., coffee about 2 oz.; 6.15 A.M., beef-tea about 2 oz.; 6.30 A.M., yolk of egg; 6.45 A.M., coffee about 2 oz.; 8 A.M., the same; 9 A.M., about 1 tablespoonful of blanc-mange, made from sea-moss farina; 9.25 A.M., beef-tea about 8 oz.; 10.30 A.M., coffee about 3 oz.; 11 A.M., beef-tea about 2 oz.; 11.45 A.M., oatmeal gruel a quarter of a pint; 12.20 P.M., beef-tea about 8 oz.; 12.30 P.M., sea-moss farina blanc-mange about 1 tablespoonful; 1 P.M., beef-tea about 2 oz.; 1.30 P.M., coffee about 3 oz.; 2.10 P.M., oatmeal gruel 1 teacupful; 3 P.M., jelly about 3 teaspoonfuls; 3.50 P.M., prune-tea (French plums infused in warm water) about 2 oz.; 4 P.M., oatmeal gruel, 1 teacupful; 4.45 P.M., jelly about 8 teaspoonfuls; 5 P.M., tea about 3 oz.; 5.30 P.M., beef-tea about 3 oz.; 6 P.M., the same; 7.10 P.M., oatmeal gruel, 1 teacupful; 8 P.M., coffee about 3 oz.; 9.10 P.M., beef-tea about 3 oz. Besides the above, one orange and one-third of a pound of grapes were consumed during the twenty-four hours. The beef-tea was made with Liebig's extract, using half a teaspoonful to one teacupful of water. The tea and coffee were taken, except in the case of cold tea, with a little milk and sugar.

*The second twenty-four hours of Weston's forty-eight hours' walk. Distance walked 80½ miles.*—Amount of urine passed, 1391.4 c.c. (49 oz.); specific gravity, 1032.80; free acidity, reckoned as oxalic acid, 2.25 grammes in 1000 c.c. (.986 grains in 1 oz.); turbid from copious lithate deposit. Microscopic characters: Amorphous lithate of soda, with a few uric-acid crystals. Composition in 1000 parts:

|                                  |     |        |
|----------------------------------|-----|--------|
| Water                            | ... | 931.38 |
| Solid residue (dried at 240° F.) | ... | 68.62  |

Incinerated residue ... 14.11

**Organic constituents—**

|                       |     |            |
|-----------------------|-----|------------|
| Urea                  | ... | 44.00      |
| Uric acid             | ... | .84        |
| Other organic matters | ... | 9.67—54.51 |

**Mineral constituents—**

|                 |     |      |
|-----------------|-----|------|
| Chlorine...     | ... | .19  |
| Sulphuric acid  | ... | 2.95 |
| Phosphoric acid | ... | 3.38 |
| Soda            | ... | 2.67 |
| Potash          | ... | 4.59 |
| Lime            | ... | .31  |
| Magnesia        | ... | .23  |

14.11

Less excess ... .21

68.62



water into gruel;  $\frac{1}{2}$  pint jelly;  $\frac{1}{2}$  oz. mixed tea;  $2\frac{1}{2}$  oz. coffee;  $8\frac{1}{2}$  oz. sugar; 2 oranges; 2 lemons; 4 yolks of eggs; 2 lb. grapes;  $1\frac{1}{2}$  oz. prunes, eaten as such; 3 pints milk; 29 Osborn biscuits (Huntley and Palmer's); 2 pints beef-tea (made from fresh meat).

*Twenty-four hours' period, commencing ten hours subsequent to the completion of Weston's seventy-five hours' walk* (9 A.M. Feb. 26th to 9 A.M. Feb. 27th).—Amount of urine passed, 351.9 c.c. (30 oz.); specific gravity, 1081.86; free acidity, reckoned as oxalic acid, 1.19 granimes in 1000 c.c. (.52 grain in 1 oz.); dark in color; copious deposit of lithates. Microscopic characters: Amorphous lithate of soda, with a few crystals of oxalate of lime. Composition in 1000 parts:

|                                  |        |
|----------------------------------|--------|
| Water                            | 922.00 |
| Solid residue (dried at 240° F.) | 78.00  |

Incinerated residue ... 15.61

Organic constituents—

|                       |             |
|-----------------------|-------------|
| Urea                  | 48.88       |
| Uric acid             | 1.31        |
| Other organic matters | 18.20—68.39 |

Mineral constituents—

|                 |           |
|-----------------|-----------|
| Chlorine...     | 4.31      |
| Sulphuric acid  | 1.87      |
| Phosphoric acid | 1.76      |
| Soda            | 4.57      |
| Potash          | 1.74      |
| Lime            | .65       |
| Magnesia        | .35       |
| Loss            | .36—15.61 |

78.00

Total quantity of solids excreted during the twenty-four hours:—

|                       |                                |
|-----------------------|--------------------------------|
| Urea                  | 31.950 grammes (492.99 grains) |
| Uric acid             | .954 „ (14.66 „ )              |
| Other organic matters | 15.99 „ (246.75 „ )            |
| Chlorine...           | 8.152 „ (48.60 „ )             |
| Sulphuric acid        | 1.863 „ (20.98 „ )             |
| Phosphoric acid       | 1.278 „ (17.75 „ )             |
| Soda                  | 8.323 „ (51.23 „ )             |
| Potash                | 1.269 „ (19.44 „ )             |
| Lime                  | .477 „ (7.40 „ )               |
| Magnesia              | .256 „ (3.86 „ )               |

*Food consumed:* Feb. 26th, 10.30 A.M. (no food having been previously taken since completion of walk), 8 tablespoonfuls of baked haricot beans; 4 oz. salt pork; 1 rissole of salted cod fish and potato; 8 biscuits; 3 buckwheat cakes; 2 breakfast-cupfuls of coffee, with milk and sugar. 2.30 P.M., 1 plate of mock turtle soup; boiled mutton and caper sauce (moderate quantity); potatoes; cauliflower; bread, 2 oz.; cup of cold coffee with ice and sugar. 8 P.M., 7 tablespoonfuls of baked haricot beans; 2 oz. salted pork; 2 rissoles of salted cod-fish and potato; 3 oz. steak; asparagus on toasted bread (about 6 oz.); 2 preserved peaches; 3 oz. bread spread with butter; 2 cups of coffee, with milk and sugar. 10.30 P.M., cup of coffee, with milk and sugar.—Feb. 27th, 1 A.M., 1 orange;  $\frac{1}{2}$  lb. grapes; 1 pint of jelly.

(To be continued.)

## News Items, Medical Facts, &c.

**TREATMENT OF DIPHTEHRITIS.**—In the last number of the *Gazzetta Medico di Roma*, Dr. Cesare Ciattaglia gives an instructive communication on the cure of diphtheritis. For some little time he has been wholly successful in treating that ordinarily stubborn malady—his remedies being the chlorate of potash internally, and the application of the hydrate of chloral to the false membranes. With these he has combined a tonic and restorative diet. To children of three to six years of age he has administered the chlorate of potash in doses varying from 10 to 15 grammes a day dissolved in 140 of water; while the hydrate of chloral, in the proportion of 4 grammes of the hydrate dissolved in 20 grammes of glycerine, is painted over the diphtheritic patches three or four times a day. For adults the dose of chlorate of potash is 20 grammes. The *calena* of evidence by which he illustrates this treatment is very convincing—one gratifying observation being the certainty with which the hydrate of chloral and glycerine, from the moment of being smeared on the false membranes or diphtheritic patches, arrested their formation, and removed entirely on the first or, at latest on the second day, the offensive and characteristic fetor. Dr. Cesare Ciattaglia, of course, disclaims all pretension to originality in this treatment. It is to Vogel that we are indebted for the use of the chlorate of potash—a remedy which that distinguished German physician employed for the first time in 1860; while the Italian practitioner, Ferrini, suggested and prescribed the painting of the false membranes with hydrate of chloral and glycerine in the diphtheritic epidemic that ravaged Tunis last year.

**EUCALYPTUS GLOBULUS IN PULMONARY GANGRENE.**—Of all the drugs employed by Dr. Bucquoy (of Cochin Hospital, Paris) in pulmonary gangrene none, he asserts, have given him better results than eucalyptus globulus. He uses it in the form of an alcoholate—two grammes—(half a drachm) daily in a mixture of water, gum, orange-flower water, and syrup. Out of the various cases he has had under his care at Cochin, five ended in cure, whilst in all the others there was a favorable modification of the odor of the breath, the sputa, and the violent cough, after carbolic acid had failed.

**SUBCUTANEOUS OSTEOTOMY.**—Lately, at the London Hospital, Mr. Maunder has practised section of bone with chisel and mallet in three instances. In each case the femur was the bone divided. In one case (that of an adult) slight suppuration occurred, while in two (a child and an adult) primary union took place. The shaft of the bone was divided to remedy distressing deformity, and the patients are now in a position to become useful members of, rather than remain burdens on, society.

**HYOSCYAMIN IN CHOREA.**—Dr. Oulmont has been very successful in five cases of chorea, treated by him with hyoscyamin in his wards of the Hôtel Dieu. In one case the patient was two months pregnant. Various drugs had failed, and notably bromide of potassium in doses of three drachms daily. Hyoscyamin was given in gradually increasing doses of from two to eight milligrammes daily. Amelioration was soon evident, and the case speedily got well.

**ABSORPTIVE POWER OF MILK.**—Attention has been called in the daily papers to a practice prevalent in some parts of the country, which appears to illustrate the power possessed by milk of absorbing atmospheric impurities. It is that of placing a saucer of new milk in a larder, to preserve meat or game from taint. It is said that not only does it answer that purpose, but that the milk after a few hours becomes so bad that no animal will touch it.

PRINTED AND PUBLISHED BY

Wm. C. HERALD, No. 38 JOHN ST., NEW YORK.

# THE LANCET.

A Journal of British and Foreign Medicine, Physiology, Surgery,  
Chemistry, Criticism, Literature, and News.

JAMES G. WAKLEY, M.D., M.R.C.S., EDITOR.

PUBLISHED MONTHLY.

No. 7.

NEW YORK, JULY, 1876.

## ABSTRACT

OF A

## Clinical Lecture

ON

## WHOOPING-COUGH.

By OCTAVIUS STURGES, M.D., F.R.C.P.,

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Assistant-Physician to the Hospital for Sick Children,  
Great Ormond-Street.

THE occurrence of a case of whooping-cough in Burlett ward reminds me to lay before you to-day some of the points of interest and difficulty in the pathology of this affection. The secret of whooping-cough must yield to clinical inquiry. Its special features and attributes are to be seen and studied in its living incidents; death leaves no discernible trace of them. Yet, common as the disease is, opportunity seldom occurs, in the course of hospital practice, of observing it adequately. The mere inspection of children in the intervals of their paroxysms, as in the out-patient room, is of little service. To study whooping-cough you must live with it. Thus it happens that experienced mothers come to know more about the disease than some practitioners, and, as a consequence, this most prevalent and least understood of infantile maladies, rarely met with in our wards, and as yet beyond the scrutiny of the pathologist, is regarded as belonging to the province of the nursery, and in the routine of clinical teaching is almost neglected.

The literature of the subject reflects these sentiments. Whooping-cough is very easily dismissed by medical writers. In the necessary absence of post-mortem illustration, there is a singular want of material on which to found or to test conclusions. Much of what has been published has reference to particular specifics, and the multitude of these alleged cures for the disease,—infallible to-day, and forgotten to-morrow,—is no less remarkable than the contrariety of opinion as to its actual nature.

What first strikes attention in reviewing the phe-

nomena of whooping-cough is the apparent incompatibility of its several factors. It claims alliance with nervous affections, with zymotic diseases, and with ordinary catarrh. If we say that it is a nervous disease, whence then has it the property of affecting others, or of protecting the present sufferer for the future? If we class it with the exanthemata, the absence of fever, indefinite duration, and mode of origin make it quite anomalous in that relation. If we insist that it is but an incident of child's bronchitis—a cough whose special character is due to peculiarities in the innervation and mode of breathing of early life, how, then, should convulsive cough become contagious, or a single attack of such cough provide future immunity?

If you consult books, you will find whooping-cough, like most other affections, divided into three stages, corresponding respectively with its approach, its presence, and its departure. There is thus the stage of incubation or latency, the stage of the fully-developed disease, and the stage of gradual decline. Yet the idea of uniformity which such a division suggests is not borne out by the reality. Whooping-cough is, in fact, stubborn to definition. It would be truer to say that it breaks in anyhow upon ordinary catarrh, that it accompanies such catarrh on and off for an indefinite time; and that its final departure, although usually gradual, is sometimes quite sudden and abrupt.

It is true, indeed, that the catarrh which precedes whooping-cough is often marked by a degree of pyrexia out of proportion to the apparent lung derangement, and that on this account, as well as from the early character of the cough, the approach of the disease may be often predicted. But it is true also both that such prediction is not always verified and that the materials for forming it are not always present. The catarrh which precedes whooping-cough cannot fairly be represented as having anything special or constant about it. There may be little or no catarrh throughout, or catarrh and whoop may begin almost together, or catarrh may be lengthened out indefinitely for a month or more before the character of the cough excites notice. Moreover, it is by no means rare for whooping-cough to stop all at once in mid-career upon change of air, and it is quite common for it to stop for a while and then return.

That in the course of catarrh young children

should come to cough paroxysmally is not of itself wonderful. The circumstances seem to lend themselves to such an occurrence. With the known characters of childish respiration, its diaphragmatic mechanism, weak inspiratory force, and the special liability of childhood to pulmonary collapse and to muscular spasm—peculiarities which remain so long as a marked tendency to whooping-cough remains,—the more striking features of the disease, its spasm during life, and the condition of lungs found after death,\* would seem to be accountable, and such as we might expect. Yet how should the convulsive spasm or the collapsed lung be either the source or the consequence of contagion?

In this obscurity we shall best find our way by following with confidence a single clue, satisfied that nature is not inconsistent. The several phenomena which are here combined have, we may be sure, some real and necessary connexion which rightly observed will not contradict but illustrate pathological laws. To reach that point of view it is necessary to consider in turn the nature of whooping-cough spasm, the actual mode of its conveyance from person to person, and the bearing of the fact that as a rule the affection occurs but once to the same individual.

What happens in the whooping-cough fit we know. By a rapid succession of violent expiratory efforts with no intervening inspiration, the child's lungs are partially emptied of air. To this occurrence there succeeds a sudden involuntary inspiratory effort, which yet, owing to a simultaneous spasm of the glottis, only partially refills the chest, giving rise at the same time to that crowing whoop from which the disease is recognised and named. Such a paroxysm may be longer or shorter, single or repeated, followed or not by general convulsion, but it has certain features which are constant. First. So long as the cough lasts, air is continually driven out, none enters; auscultation detects no inspiratory act whatever; percussion discovers a perceptible diminution of chest resonance as the cough proceeds. Secondly. The involuntary inspiration is not free or unopposed; it is met by a partial spasmodic closure of the glottis. So soon, indeed, as the larynx ceases so to act, this, the main feature of the disease, disappears. The *whooping-cough*, and, as some think, the danger of contagion, are no more. And, without trenching upon hypothesis, we may go a step further. By this whooping-cough spasm the rapid rhythmical movements of the diaphragm, by means of which the child breathes, are suddenly suspended; we have in their place a violent and continuous expulsion of air from the chest, whereby the space occupied by the lungs is considerably diminished. With the continuance of the cough paroxysm these organs come to occupy less and less room, while, in proportion to their decreasing bulk, the relaxed and for the time paralysed diaphragm mounts higher and higher within the chest. Picturing the child's condition at the end of such a paroxysm, we are to conceive the contracted and almost emptied lungs with a diaphragm relaxed to its utmost extent, and whose proper function is for the time suspended. We are to conceive this in a subject whose ribs aid little or nothing in the work of respiration, whose

inspiratory power is at the best but feeble, while its nervous irritability is extreme. What happens next? By a sudden involuntary inspiration the air is drawn "with much force and velocity" through the half-closed chink of the glottis. The breath that is wanted comes with spasmodic force, but there is opposed to it this other spasm on the part of the larynx; so that, after all, the air is admitted but sparingly. Observe that this is not a deep inspiration merely, like the soft prolonged sigh of one who needs an extra supply of air—nay, it is not a deep inspiration at all: it is a shallow one. The blind violence of the inspiratory effort is rendered abortive by means of the laryngeal spasm. The air that enters, as auscultation witnesses, does not penetrate far.

How can we so well account for a spasm like this, or interpret the perverted mechanism of respiration, as by watching still further the action of the diaphragm. With the extreme relaxation of this muscle, and the temporary abeyance of its function, I conceive it probable that the very first in the train of events which finds expression in the whoop is a spasmodic contraction and descent of the diaphragm. Without appealing, for the present, to the medulla oblongata or any reflex mode of stimulation, it seems reasonable to suppose that, in the circumstances of the young child, a sudden suspension of the rhythmical action of its great breathing muscle, and not suspension merely, but such active interference with its function as is implied by its being, so to speak, sucked up into the chest, would suffice of itself (sooner or later, according to the nervous stability of the child) to give rise to spasmodic contraction. In other words, so soon as the diaphragm, from the abnormal condition of relaxation in which it finds itself at the end of the convulsive cough, first resumes or attempts to resume, its orderly method of work, I should expect that its first contractile effort should be of the nature of spasm; that the sudden descent should, as in an instant, make room for the full expansion of the pumped-out lung, and that the violence of this revolution should be met by a conservative spasm on the part of the glottis—a spasm which, in fact, controls and regulates that of the diaphragm.

Whether such an hypothesis is to be accepted or not must depend, of course, upon its harmony with other observed phenomena of disturbed respiration under like circumstances. Now there is nothing precisely like whooping-cough, but there are diseased states intimately allied with it. There is spasmodic asthma, for instance, implicating the same organs, due to the same or a similar nervous irritability, and often, in later life, taking the place of whooping-cough. The relation of these two—of the asthmatic fit and the whooping-cough fit—is seen chiefly by contrast. Asthma fit is a condition of extreme inspiration, whooping-cough fit of extreme expiration. The one has not the breath to cough or blow out a candle, the other is a succession of coughs. The asthma fit yields with a sudden expiratory jerk quite peculiar to the disease; the whooping-cough fit yields with a sudden inspiratory spasm which is equally peculiar. I am speaking now of the mechanism of these two paroxysms. They have, indeed, as we shall see presently, a deeper connexion, witnessed to in many ways, as in the frequent origin of the one disease out of the other, and the fact that similar causes will excite and similar expedients will cure

\* The lung-collapse found in children dying directly of whooping-cough was fully described by Sir James Alderson in the *Medico-Chirurgical Transactions* as long ago as 1830.

both. But for mere mechanism we may appeal, not only to pure asthma, but also to general emphysema. How striking is the almost invariable intrusion of genuine asthmatic spasm into the history of vesicular emphysema. Whence comes it that the "asthmatic element" so uniformly becomes superadded to chronic bronchitis so soon as the lungs have undergone emphysematous change? Why should this condition entail, not dyspnoea merely, but jerking respiration and asthmatic fits? May it not be that the common features in these three affections—asthma, emphysema, whooping-cough—are due to a common factor: to a perverted or impaired action, that is, on the part of the diaphragm, purely reflex in the case of unmixed asthma, mainly mechanical in the case of emphysema and whooping-cough; in the one due to the interference of voluminous inelastic lung, in the other to lung collapse and respiratory stasis?

You will say, perhaps, that however the action of the diaphragm may account for the whoop of whooping-cough, this point is really of secondary importance, since it is not the whoop, but the paroxysmal cough, which betrays the disease. Children may whoop or not, according to the violence and duration of their cough.\* The whoop is an accident to be heard on and off. What we seek is the origin of the paroxysmal cough, and the reason why, so soon as a child gets it (or, according to some, for an indefinite period before and after), it becomes a source of infection.

Now I pass over for the moment the undoubted fact that, according to tradition and popular as well as medical belief, the whoop itself is very intimately connected with the contagion of the disease, and that no doctor or mother will say for certain that a child has whooping-cough unless and until it both coughs and whoops, and I would inquire what can be made out in respect of the origin and endowments of this affection upon the credit of its nervous relations. Supposing this a nervous disease, what is there about the diseases of that class—all of them sufficiently mysterious—of which we may legitimately avail ourselves to explain, or rather to gather together, and formulate the apparent anomalies of whooping-cough?

It is a nervous disease. Witness to that the recurring nocturnal dyspnoea which often ushers in the affection and is lost in it; the strictly periodic character, in many instances, of its paroxysms; the influence of habit; the control exercised by the mind, so that by admonition, and still more by threats, the coughing fits can be held in some check. There is besides the remarkable fact—true only of nervous diseases—that whooping-cough, like asthma, and less notably like chorea, is sometimes suddenly arrested by change of place. Moreover, whooping-cough gives origin to other diseases unquestionably nervous; it gives origin especially to the purest spasmodic asthma where there is neither emphysema nor any other organic lesion to explain the sequence. We may be content indeed, and in accord with general opinion, in

saying that the earliest *motive* of whooping-cough, as of asthma, is to be found in a "morbid exaltation of sensibility." With the instability of the nervous system in early childhood coughing paroxysm (like asthmatic paroxysm) is immediately excited by *some irritation or other* of the pulmonary mucous membrane. Thus guarded and generalised the definition of whooping-cough is pretty generally admitted.

But in all this we do but increase our difficulties. We have to regard the disease in its entirety. Mechanical explanations are too narrow to embrace it all. By as much as we make it probable that whooping-cough is apt to be excited by external stimulation, and when excited to exhibit the particular phenomena which we see owing to the pattern of the childish framework, by just so much do we exclude and render unaccountable those other features of the disease which seem to link it with contagious fevers.

There is no character of whooping-cough more fully recognised in the present day (it was not always so) than its property of spreading. There can be little doubt, indeed, that this feature of the complaint is, from the nature of the case, almost certain to be overestimated. Any affection which is both common and prone to affect large numbers at a particular time and place, will be sure to obtain a reputation for infection greater than it deserves. The spontaneous origin of the disease, however probable in itself, will never be allowed in the presence of a possible source of infection. There is no affection requiring such caution in this respect as whooping-cough, for there is none so common, or so often seen in an epidemic form. So prevalent is it that there are those who believe that it is the common lot of humanity—that in some shape or other no child born of woman can escape it. Certainly our hospital figures will understate the actual liability, since they include a large number of neglected children of whom nothing is known. Now, taking 523 children of the poor admitted into the Hospital for Sick Children, just as they come, I find that out of 246 boys, 105 were known to have had whooping-cough; while of the 277 girls, 132 were known to have had it. If, then, we admit, as we must, that a larger proportion of these have had the disease than the record shows, it will probably be no overstatement if we say that half of all children born suffer from whooping-cough. Of what other affection can this be said?

But this is not all. Whooping-cough arises out of catarrh. A child with catarrh is so far more prone to the disease than another child. The chances, then, being pretty even for all children whatever of getting whooping-cough or escaping it, the probability in the case of the catarrhal child will be in favor of its developing the disease. And, indeed, if we hold with some authorities, that the whoop is no necessary part of the disease, but only a sign and measure of its spasmodic severity, it would be impossible, on the evidence of figures, to deny that whooping-cough was the universal inheritance. The statement could not be positively affirmed, but if a revelation of that kind were made to us, there is nothing in our statistics to make it antecedently improbable.

It follows that, however infectious or contagious whooping-cough may actually be, it is certain to appear to be more of both than it really is. No

\* It is not to be supposed, nor would my theory imply, that the violence of the whoop and of laryngeal spasm is in proportion to the length of the cough paroxysm. It would be so other things being equal; but other things are not equal. Especially does the nervous stability vary between one child and another. In one catarrh will be the chief feature, the whoop only occurring occasionally when cough is unusually prolonged. In another and probably younger child, with little or no catarrh, the liability to spasm will be extreme, so that a very slight disturbance of the diaphragmatic rhythm will suffice to arouse it.

particular instance of the disease will be accepted as spontaneous when by the most diligent search some other instances can be discovered in any sort of connexion with it. From the sociable habits of children and the extreme commonness of whooping-cough amongst them, such instances will seldom be wanting. If none should immediately occur in the associations of the time, we do not hesitate to interrogate the past and even the future. Two illustrations are before me just now. In the first, two children living apart, but in a district of London where whooping-cough was very prevalent, spent an afternoon together; neither was suspected of whooping-cough, but one had cough. They parted, and some time later this latter developed whooping-cough. After a while (I have not the exact dates) the other had whooping-cough also. There is no doubt whatever in the mind of her mother that she took it of her companion. In the second instance two other children were in close company on a certain day. Neither had whooping-cough, but the one had had it in a different part of the country ten months before. She had not whooped for eight months, but in that interval (five months before the meeting) had suffered from bronchitis. Ten days after the visit the second child began to cough, and within a fortnight to whoop. There is no doubt whatever in the mind of the parent of this child (who in this instance is a well-known physician) that this, too, was an example of contagion. I am not saying that he is wrong—I only say that if the influence of contagion is made to reach back and to stretch forwards without limit, we may get at it, with due industry, in every instance.

We are not therefore, to deny that whooping-cough is contagious. That is supported by an independent set of facts; we are justified in denying some of the modes in which it is said to be conveyed, supposing these to be in themselves improbable. From the nature of the case, statements in support of every conceivable method of conveyance must be most easily adduced. The mothers of England, with whom sometimes a certain amount of evidence is equivalent to demonstration, could bring narratives to show that whooping-cough contagion is carried about through time and space with no assignable limit. There is no need to be disturbed by such narrations.

Accepting, then, the fact that whooping-cough is contagious, both the circumstances of the disease and, still more, its own individual character make it difficult to determine either the mode or the extent of its contagiousness. That it should spread by any method at all analogous to that of scarlatina or measles seems quite incredible. Whooping-cough, if we will but look to the nursery and not to the books, has no uniform course and no necessary pyrexia. It lingers on indefinitely, and may have distinct intermissions. In many instances there is no disturbance of health whatever, only this strange convulsion aroused it may be by some obvious external cause. The doctrine of a specific poison, residing no one knows where, and communicated no one knows how, is not only a pure assumption, but it imports difficulties of its own. How, for instance, upon that hypothesis, are we to account for the fact that a child with catarrh becomes *thereby* liable to whooping-cough. You never get the one prevalent but the other is prevalent also. Dr. Edward Smith has conclusively shown that the two affec-

tions rise and fall together.\* Whooping-cough is in harmony with catarrh, and out of harmony with zymotic diseases. Is its poison, then, generated somehow out of catarrh?

You will remind me, no doubt, that in certain epidemics of measles whooping-cough prevails along with it. I conceive that it does so because measles involves catarrh. In any case the difficulty is not lessened by supposing that the *materies morbi* of whooping-cough is, in some unknown manner, attracted by the poison of measles. If whooping-cough is the solitary illustration of such a principle it is unfortunate that its claims to specific character should, on other grounds, be so equivocal. It is as little conceivable that the reception of the poison of measles should confer a liability to receive the poison of whooping-cough as that whooping-cough itself, if due to a *materies morbi*, should suddenly depart under the influence of change of air.

I cannot discover any published narratives describing the precise mode in which whooping-cough spreads, not as an epidemic, but when imported from a distance by the introduction into a healthy locality of an infected child. The popular belief (by no means to be neglected) would seem to be, as I have said, that its contagion is far-reaching and irresistible. This is so common an opinion that, although mothers do not underrate the dangers of whooping-cough, isolation is seldom attempted. Medical men who believe most steadfastly in the conveyance of the affection by a material agent are often equally positive in asserting that no precautions, such as its material nature would suggest, are practically efficient to ward it off. Accurate observations on this point on a sufficiently large scale are sorely needed. The experience of the Hospital for Sick Children,† such as it is, tends to show that the spreading is not from bed to bed, but from one spot to another. It does not travel in steps in a given direction, but hops about hither and thither, so that within a certain area, *ceteris paribus*, all the individuals included are equally liable to it. The child in the next cot to whooping-cough is not more dangerously situated than the child furthest removed, or even than a child in the neighboring ward.

In this, as in other respects, therefore, whooping-cough seems out of the rule of those diseases which it partially resembles. No single category can compass it. In its nervous relations it is consistent and uniform; but, looking further, it becomes anomalous and surprising in that property of contagion which, to some extent, it seems to share with diseases of a totally different character. We must either accept this position, and make a special place for whooping-cough, or we must adopt some view of its contagion and of its single occurrence which shall be exclusive of any theory of specific poison, and in conformity with its nervous associations.

What can be made out of whooping-cough on this latter hypothesis? May it not be infectious, not like scarlatina or measles, but like fear or pity

\* See Medical and Chirurgical Transactions, vol. 37. "The great similarity," says Dr. Smith, "between whooping-cough and chest diseases, contrasted with the dissimilarity between the former and zymotic affections, cannot fail to induce us to regard them as most closely allied, and may almost suffice to induce us to inquire if they are not in their morality the same disease."

† The new hospital in Great Ormond-street contains a ward specially devoted to whooping-cough. We are thus, for the first time provided with a means of studying this obscure disease accurately and continuously.

or discontent? It would, at least, be difficult to say how far contagion in that sense enters into the history of nervous affections, and quite misleading arbitrarily to limit the operation of that principle by calling it imitation, conscious or unconscious. Imitation is an attempt to resemble: "unconscious attempt" is a confusion of words. Let us consider the phenomena themselves, rather than reduce their significance by inadequate expression. How cough is contagious, so that in a multitude, however absorbed, the coughing of one will impress the rest, no one who goes to church need be told. It is the same with yawning and with laughter. Similarly, nervous diseases are not imitated merely; they are conveyed. The girl in presence of hysteria does not imitate it; she gets it. The child in the same ward with chorea does not attempt to resemble choreal movements; she gets the disease chorea. There are some notable instances where epilepsy has been caught in the same way. "Catching a habit" is a proverbial expression, and applies in a special manner to early childhood; but the full force of the principle which it illustrates in its further application to disease is hardly sufficiently admitted.

Some facts of whooping-cough which tend to bring it within the operation of this law have been already incidentally mentioned. The disease spreads, not by contact, or absolute propinquity, but to the children about and within hearing. You cannot isolate it. Mere infants, liable enough to whooping-cough, and with a conformation admirably adapted for its reception, are yet irreceptive of it from others. Thus, the baby will either escape the family complaint altogether, or take it late, when by long persistence the impression it makes has forced itself upon its dull perceptions. Meanwhile, the elder children will have the disease strictly in company. The whooping of one will be a signal for the rest, and the whole will cough in chorus.

It would be fanciful and absurd to ascribe the wide dissemination of whooping-cough mainly to the operation of this principle of conveyed nervous impression, but it is neither the one nor the other to suppose that this influence co-operates with others to impart to whooping-cough a seeming likeness to zymotic diseases. An affection to which all young children are liable under *any* circumstances, and which, like the catarrh so intimately associated with it, is very apt to be epidemic, needs no more than this property of nervous contagion to earn the character which whooping-cough has maintained since the days of Cullen. On the other hand, if whooping-cough is quite independent of this form of contagion, it is the only disease of the kind that is so. There is no affection with a voluntary element about it, whether chorea, or hysteria, or the act of yawning, that does not spread, more or less, by involuntary repetition. Considering the impressibility of the female sex, and the strong "imitative" instinct of young children, we should be led to believe that in a nervous disease proper to childhood, and commonest with girls, the influence of nervous contagion should be not absent but conspicuous. I might add that those who would reject this view, preferring that of a specific poison, will yet maintain, with Dr. Babington, that when this poison is spent "mere habit will perpetuate what first originated in disease." If the whooping-cough spasm can

thus be reduced to a habit, it is probable that, like other habits, it may be originally excited in a pre-disposed person by involuntary imitation (so to call it) of another.

But there is a further difficulty. Whooping-cough, like measles and scarlatina, happens but once. It is here, you may say, dissimilar alike to nervous and to respiratory diseases. Both of these are apt to become chronic, and easily acquire the habit of recurrence. We must observe, however, that there is no intimate likeness between the non-recurrence of certain zymotic diseases and the non-recurrence of whooping-cough. Strictly speaking, whooping-cough is very apt to recur. Every nurse will tell you that this is the great trouble and worry of the complaint. The whoop will appear and disappear. \* So long as bronchial catarrh endures no interval of freedom will make its return improbable. You are never sure that you have done with it until the lungs are quite free, and the cough is gone. This is not like scarlatina or measles—it is strikingly unlike them. There is no such thing as the repetition of the distinctive features of a specific fever within a very short period from the first attack. The protection conferred is, for the time, absolute. In its habit of receding and advancing whooping-cough is true to the pattern of nervous diseases; it is quite inconsistent with the orderly course and progress of all infectious fevers whatsoever.

But why should children, although they may whoop on and off indefinitely during a single catarrhal attack, have in their lives but a single bout, so to speak, of whooping-cough? Why should whooping with the catarrh of this year secure the patient against whooping with the precisely similar catarrh of next year? Here too, I believe that the nervous hypothesis is competent to explain the facts, and that whooping-cough does but illustrate the common law in relation to this class of affections. Recurrence is the rule of all nervous disease, but the recurrence is not by way of exact repetition. We do not cease to suffer from the cradle to the grave, only the manner changes. As the child grows he becomes exposed in turn to all the phases of nervous disorder. There is a fixed time and duration for each—a duration which, inasmuch as it corresponds with certain epochs of life, will be longer or shorter accordingly. Thus the period of dormant infancy is followed by that of dentition, a short and tumultuous time, covering some twenty months, of most active development, and subject to peculiar incidents. To this succeeds an interval of about ten years of comparative calm, interrupted only by the approach of puberty. Nervous lesions correspond accurately with these transitions: each has its turn and its proper duration accordingly. That chorea should recur and whooping-cough not is not really anomalous. Recurrence is common to both, but the period allotted for the one is longer than for the other. The human subject continues prone to whooping-cough hardly more than two years. "More than half the cases," says my distinguished colleague, Dr. West, "occur before three years." He continues prone to chorea for five times that period. There is nothing that whooping-cough confers which prevents its return in the future, only when that future arrives the child has outgrown its proclivity; it has discharged its obligation in this respect, or rather it has changed the

nature of its liabilities. On the other hand, the longer period allotted to chorea (commencing accurately at the time of life when whooping-cough begins to decline, and becoming more intrastable as puberty is neared) admits of the exhibition of that quality of recurrence which is one of its marked characteristics.

But observe, further, that this liability or proneness to whooping-cough, which, when the whole race is considered, is comprehended within a very short period, must be still further limited for each individual. When it is said, for instance, that, for all children whatever, a special liability to whooping-cough is compassed between two years old and six, it is implied that the individual liability falls somewhere between these extremes. Varying with the rate of development, one child, or one group of children, will encounter the liability at two, another at three, and so on. Hence the fact of a child getting whooping-cough but once will be due to the fact that this single attack covers, or nearly covers, the whole period of its special liability in this respect.\*

Why, then, you will say, does the disease, once introduced, run through the whole family, attacking children at various ages indifferently in the absence of any epidemic or other common cause? I would answer that it is not the common rule of whooping-cough to behave so. It usually spares, not only the elder children, but one or two of the younger ones also, both those that have suffered before and one or two besides. It spares, that is to say (or rather, it is likely to spare), both those with whom the period of special liability is overpast, whether they have discharged the debt or escaped it, and those, too, who have not yet reached it. The fact that a child has had whooping-cough is the best evidence that it has passed its liable time. For the others we may not arbitrarily fix this period. It will vary within due limits with the rate of development, as the period of dentition and the advent of puberty vary.

But I may not pursue the subject further to-day, nor should I have been justified in detaining you so long but for the plea that the pathology of whooping-cough is admittedly a vexed question. The many practical issues involved will easily suggest themselves to your own minds. If, for instance, whooping-cough has at all the relations I would claim for it, not only would certain obvious precautions suffice in the absence of a common cause to prevent its spread, but that method of treatment by change of habit and residence and associations, so admirably described by the late Dr. Salter in his work upon Asthma, and epitomised by the French phrase "profondely modifying the situation," should be as effectual in whooping-cough as in the disease so intimately allied with it.

The conclusions to be deduced from what has been said would be something as follows:—

1. Whooping-cough is a nervous disease of immature life, due immediately, like nervous asthma, to a morbid exaltation of sensibility of the bronchial mucous membrane. Although possible in a

modified form at all ages, it has its period of special liability and full development simultaneously with that time of life when the nervous system is irritable and the mechanism of respiration diaphragmatic. A child of the proper age with catarrh and cough is thus on the very brink of whooping-cough. A large proportion of such children will develop the disease for themselves upon casual provocation, all contagion and all epidemic influence apart.

2. The whoop of whooping-cough is due to a spasmodic contraction of the diaphragm which follows it extreme relaxation with the emptying of the lungs by spasmodic cough, the force of the inrush of air being met by a conservative spasm on the part of the glottis.

3. The natural history and relations of whooping-cough—its uneven course, indeterminate duration, method of recovery and cure, frequent absence of pyrexia, and seasons of prevalence—are in striking contrast with diseases of the zymotic class. Admitting the fact of its contagion, the great commonness of the disease and its association with epidemic catarrh, coupled with the popular belief that its source of infection may be indefinitely remote, are circumstances which must combine to render whooping-cough more contagious in appearance than it is in fact.

4. In its character as a purely nervous disease whooping-cough may very well be contagious like other nervous affections of a quasi-voluntary kind. The assumption of a specific morbid poison is both hypothetical and gratuitous, or so nearly gratuitous that the facts it seems to explain are insufficient to counterbalance its inherent improbability.

5. The non-recurrence of whooping-cough is not, in strictness, analogous to the non-recurrence of contagious fevers, nor out of real harmony with the pattern of nervous disease. It is the rule that affections of this class alter their shape with the successive epochs of life, so that each will appear either solitary or recurrent, according as the time allotted for it is shorter or longer. The after-infancy period to which whooping-cough attaches is one of brief duration and special liabilities. The features of the disease are in strict correspondence with the characteristics of its time of life.

6. The specific remedies for whooping-cough (which have their season and may be said now to include all drugs whatever of any potency) have all of them a certain testimony in their favor. They agree in a single point: whether by their nauseousness, the grievous method of their application, or the disturbance they bring to the child's habits and surroundings, the best vaunted remedies—emetics, sponging of the larynx, ill-flavored inhalation, change of scene, beating with the rod,—all are calculated to *impress* the patient, and find their use accordingly.

\* It would have been out of place in this lecture to allude to Dr. Living's admirable remarks on Nerve-storms, yet his views seem strictly applicable here. The notion of accumulation and discharge may be fitly applied to explain that period of immunity which follows whooping-cough, and, for the time, "protects" the child, so to speak, from a second attack.—See Dr. E. Living on Megrim, chap. v.

CREMATION.—The Hygiene Commission of Paris, in its report on Cremation, states that while the practice would offer many advantages, a great if not insuperable objection to it would be found in the impossibility, in the event of its adoption, of detecting certain crimes—thus rendering a necropsy imperative in all cases of death.



## ABSTRACT

OF THE

## Croonian Lectures

ON THE

## PATHOLOGY AND RELATIONS OF ALBUMINURIA.

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## LECTURE II.

THE lecture commenced with a consideration of the secondary lesions which ensue upon the cardio-vascular change proper to the granular kidney. The retinal change, involving hyperæmia, serous infiltration, hæmorrhage, and white spots, was described as due to arterial leakage or rupture connected with vascular deterioration and increased pressure. The optic state, generally spoken of comprehensively as albuminuric retinitis, was not peculiar to the granular kidney, though most commonly associated with it. It was found sometimes both with diffuse nephritis and lardaceous infiltration.

The retinal was to be regarded as but the outward and visible sign of a universal vascular change. It almost always showed advanced renal disease; though with the granular kidney it might occur while as yet the disorder had been undecleared by any other prominent disturbance, and thus constitute its first obvious symptom. The form of renal disease most apt to become thus complicated was that which sometimes ensued upon pregnancy—a fact to be, perhaps, explained by the increase of vascular tension which normally belongs to this state. The exceptions to the general rule which associates the granular kidney with albuminuric retinitis, though not numerous, were sufficient to show that there was no necessary pathological connexion or identity of kind between the renal and the retinal change, but only that the retinal change was the expression of a condition which, though most common with the granular kidney, was not peculiar to it.

The association of the same form of renal disease with other hæmorrhagic lesions, more particularly with cerebral apoplexy, was considered. It was shown that two-thirds of the instances of fatal extravasation within the skull were of renal origin; and the occasional occurrence of cerebral hæmorrhage even in childhood, when the kidneys were granular, was exemplified by a striking instance in a girl of twelve.

Passing to the inflammatory results of the disease, pericarditis was insisted on as especially connected with it. As a pathological rarity, a peculiar form of ulceration of the small bowel had been found in connexion with, and apparently due to, the renal change. The ulcers were described as affecting the lower end of the small bowel, and as setting up local peritonitis.

Two instances of renal granulation as affecting children were given in detail, and others briefly referred to, showing that at the earliest periods of life at which the disease was found the cardio-

vascular changes were present, the heart and arteries being constantly thickened, while cerebral and retinal hæmorrhages were of occasional occurrence.

Touching upon the association of the renal change, as part of a common fibrosis, with a similar change in other organs, it was shown that, taking the liver as the test, renal and hepatic fibrosis so seldom occurred together that they must be generally looked upon as due to separate causes, not to any general fibrotic tendency. And with regard to general fibroid thickening as the result of age, it was inferred, from the examination of three nonagenarians, to be less frequent than fatty, calcareous, and atrophic changes. The conclusion was generally stated that, putting aside for the present the associated affections of the arteries, the kidneys became the subjects of fibrotic change for the most part alone, as the result of a morbid instigation proper to themselves, not distributed over many organs.

Proceeding to inquire into the causes of the organic change, it was shown that in most cases they could not be isolated, but belonged to the common ways and even tenor of life. Hereditary influence could be sometimes discovered, as was illustrated by reference to an ancient family in which three generations, comprising seventeen individuals, had furnished eleven subjects of the disease. Climate, which to be most injurious must be temperate but variable, was a fruitful source of the complaint. Coming to causes which fall more partially, those involving mechanical congestion of the kidney, obstructive disease of the heart, and pregnancy, were discussed. The disease could be traced also to circumstances, like gout, of which the mode of action was less obvious; to the influence of renal irritants, such as lead and alcohol; it could be recognised as a late result of scarlatina, or of diffused nephritis, however induced; it occasionally appeared to ensue upon the congestion of tropical intermittents; and, finally, it was attributed to the prolonged influence of accumulated urine.

Thus, showing that the renal fibrosis, though often of obscure origin, was sometimes to be traced to causes acting locally on the gland by way of mechanical congestion or specific irritation, it was next made apparent, that whether the renal disease was of determinate or doubtful source, the cardio-vascular change was equally present.

With these facts a vexed question was approached—the significance of the cardio-vascular changes, whether directly consequent upon the glandular embarrassment or only associated with it as a parallel effect of a common cause.

The albuminuric change of vessel was shown to be present not only with the fibrotic kidney of advanced life, but as constantly with that of childhood—where, to say the least, changes allied to those of age were improbable,—with the condition as traceable to mechanical congestion or modes of glandular irritation, and not less so when it ensued as the sequel of scarlatinal nephritis or nephritis arising from cold or other mischance. The evidence already adduced that a similar arterial change may be produced by comparatively recent nephritis was reverted to, and allusion made to the observation of the same vascular state as the result of disablement of the kidney by stone or other accident.

The conclusion was held to be inevitable that the arterial and cardiac changes were not, in gene-

ral, parts of a deterioration originating systematically, but were definite consequences of the glandular injury.

The nature of the arterial and cardiac changes involving muscular hypertrophy and fibroid induration, together with their occurrence in inflammatory and fibrotic disease where arterial tension is increased, and their absence with the lardaceous, with which, as a rule, whether in consequence of wasting discharges or of the little impairment which until late falls upon the secreting power of the kidney, arterial tension is little or not at all exalted, led to the belief that the structural alteration was the result of the tension by which it is accompanied and proceeded.

To seek the cause of the tension or fulness of the arterial system it must be placed in obstruction of its outflow, and the only question which remained for discussion was whether the hindrance should be placed, with Bright, in the capillaries, or, with Johnson, in the arterioles.

Largely as Johnson's observation of muscular hypertrophy had been borne out by what had already been advanced, his explanation, according to which the heart and arteries became hypertrophied by antagonistic action, was held to be less tenable than the older hypothesis. Accepting as the starting-point of the vascular changes a condition of blood which rendered it difficult of capillary transmission, the complicated series of changes admitted of easy explanation. The heart and the arteries were together hypertrophied in their efforts to close upon the blood accumulating in them from the obstacle in front of both. With this the increased pressure on the vessel-walls caused increased soakage into them, and ultimately fibroid induration of their coats, after the manner of congestion wherever it may occur. The associated degenerative changes were probably due to the irritative effect of the impure blood. Thus, as of old, the whole pathological series was traced to glandular inefficiency and uræmic contamination.

Whether the cardio-vascular change have other modes of origin—whether, as is probable, the state of blood necessary to cause it may be produced by circumstances apart from renal disease, are questions as yet unanswered. No doubt in many cases hypertrophy of the heart gives evidence of arterial change while as yet there is little direct evidence of renal disease. In such cases the renal disease was probably more often hidden than absent. The kidneys might be so far destroyed that fatal uræmia was imminent, but the urine contain no albumen, or a scarcely appreciable trace. The vascular mischief, therefore, might occur in connexion with latent renal disease; how far independently of renal disease was yet *sub judice*.

### LECTURE III.

THE pathology of the lardaceous change was now discussed as of an infiltration beginning with the arteries, and afterwards involving other tissues, of a material the nature of which was a matter of much interest. It had long been known that the material with which lardaceous organs were infiltrated was nitrogenous, and did not differ appreciably in its ultimate composition from fibrine and albumen. The interest chiefly lay in the points of difference between the lardaceous matter and the healthy tissues; one of the most important of these

was to be found in the relation of the morbid deposit to the alkalies. The presence of the lardaceous material could be at once detected by its reaction with iodine in a manner to be presently explained. If now the weakest solution of potash or soda, or a stronger one of ammonia, be brought into contact with the infiltrated structure, its power of reacting with iodine was at once and finally abolished, and that without any destruction of the normal tissue, or even material injury to its microscope-structure. This appeared to depend on the extraordinary solubility of the morbid deposit in alkalies, a property which Dr. Marcet took advantage of to obtain the material for analysis.

Pursuing further the relation of the alkalies to the new material, it was found that infiltrated organs, taking the liver as best suited for the comparison, were deficient in alkali, especially in potash. In a series of healthy livers the total alkaline salts gave an average of 1.0, the potash .209, in 100 parts. In a series of lardaceous livers the total alkaline salts averaged .739, the potash .169, in 100 parts. While the alkaline salts were diminished under the disease, the salts of the earths were increased. These observations had since been confirmed by some made by Dr. Dupré at the request of the Pathological Society. Comparing the mineral constituents of three healthy livers with three highly lardaceous livers, he found that with the healthy liver the potash amounted on an average to .283 per cent., with the lardaceous to .131 per cent. The chloride of sodium was somewhat increased in the morbid tissue.

Passing now to another organ, it was shown with regard to the spleen that parallel statements might be made. The ash of this organ had been examined in nine instances; three healthy, five lardaceous, and one of rickety enlargement. With the lardaceous change the potash was lessened, as compared to the state of health, from an average of .811 per cent. to one of .196 per cent. The soda varied much, but had apparently suffered no loss. The earthy salts were generally increased. With the rickety enlargement, one superficially resembling the lardaceous, though profoundly different from it, diminution was found in the earthy salts only.

Reverting to the iodine reaction by which the lardaceous tissue was ordinarily distinguished, it was described as depending on the greater absorption and retention of iodine by the morbid deposit. The supposed amyloid blue had not come within the observation of the lecturer; but the interest which pertained to this reaction, while the deposit was thought to be starchy, no longer existed now that it was known to be nitrogenous. A more obvious interest attached to the remarkable manner in which some of the normal constituents of the body could be made to yield the reaction. This could be done by imparting to them acidity. Fibrine under this influence yielded so exact a counterfeit of the lardaceous reaction that he had ventured to call dealkalised fibrine artificial amyloid matter. Fibrine dissolved in dilute hydrochloric acid gave a precipitate with iodine of the characteristic color, and the same result could be shown on the acidified fibrine as recovered by evaporation. This manifestation of the "amyloid" reaction by certain constituents of the blood on their being transferred from alkaline to acid combination, the paucity of potash in lardaceous organs, and the extreme solubility of the morbid

deposit in alkalies, which would seem to prohibit its deposition from blood of normal alkalinity—all these suggest that a deficiency of the alkaline solvent, and a consequent separation from the blood of something for the solution of which the means no longer suffice, is a rude ideal of the morbid process.

The causes of the disease were next considered. Reference was made to a series of sixty-six cases, published some years ago, which had led to the inference that the disorder was especially caused by suppuration, independently of any cachectic condition, whether tubercular, cancerous, or syphilitic, with which the discharge might happen to be associated. These conclusions were tested by a tabular analysis of 88 cases fatal in St. George's Hospital since the publication of the previous observations. Of these 60 were connected with ascertained, 4 with presumed suppuration. Cancer existed in 2, tubercle in 87, while there was evidence of syphilis, historical or pathological, in 18. Suppuration was often effective in causing the disease, when of purely local or accidental origin, as in renal stone, ovarian or pelvic inflammation, accident, surgery gangrene or bed-sores. Cachexia might be at once dismissed as not necessary to the production of the lardaceous change. Tubercle and cancer were connected with it only by means of the suppuration they so often caused. Syphilis stood in a different relation to the disorder; it was alone an adequate cause of the lardaceous infiltration, however helped by the discharge due to some of its secondary and tertiary lesions. In the table the disease was attributed to syphilis without excessive suppuration in 11 instances, while evidence or record of syphilis complicated the antecedents of 7 others.

Taking the disease as due to suppuration in the abstract, the *modus operandi* was taken into question. The infective and exhaustive results of suppuration were considered, and the lardaceous change attributed to the latter. Then as to the essential loss involved in suppuration which occasioned the result, it was inferred that of all the organic constituents of the discharge, the white corpuscles were those only which could with any probability be thought to impoverish the system by their removal. The potash of the blood was chiefly contained in its corpuscles, and largely in the white, as evident from the composition of pus. It was probable, therefore, that suppuration, which essentially consisted in the escape of these corpuscles, might produce its morbid results which were characterised by want of potash by their deficiency. Whatever were the action of the leucocytes, a discharge of pus was virtually a discharge of potash, since pus, chemically speaking, differed from blood mainly in the subabundance of this essential alkali. This loss was apparently the link between suppuration and the lardaceous deposit, and partial impoverishment of the blood and deposition of what was in relative excess presented itself as a rough outline of the process.

But besides the exhaustion of discharge, it was clear that there were other modes by which the disorder could be produced. Diminished income was as bad as increased expenditure, and defective assimilation equivalent to increased waste. Under the influence of syphilis we should be prepared to find nutrition impaired in any manner: the attenuation of its subjects showed that their food was not turned to purpose; could it be that the white cor-

puscles were insufficiently developed and their accompanying potash insufficiently introduced?

The organic results of the disorder, in relation especially to renal disease, were then considered, with particular reference to the irritative results of the infiltration in the setting up of tubal catarrh and intertubal nucleation, fibrosis and granulation. The occasional presence of arterial and cardiac hypertrophy was regarded as the necessary result of these secondary renal disturbances, though lardaceous infiltration *per se* had little tendency to cause uræmia, and seldom any result of this nature. No doubt the exhausting discharges productive of and consequent upon the lardaceous change kept down the vascular tension and prevented its results.

The lecture concluded with a consideration of the secondary lesions associated with the lardaceous condition.

The following observations upon the treatment of the forms of albuminuria, the nature of which had been discussed in the lectures, should have formed the conclusion of the course had time permitted of their delivery:—

I have hitherto said nothing of the treatment of the disorders the nature and relations of which have occupied our attention. It would not be suitable that I should occupy the College with the details of recognised and familiar practice. But one or two points call for mention, and I have chosen to place them together, distinguishing, when needful, what applies to one state of kidney and not to another, rather than to incur the danger of repetition by annexing to each separately any reference to the measures by which it should be met.

In treating the disorders of the vital gland in question our measures must not be limited by the bounds of the *materia medica*. The circumstances of ordinary life—food, drink, and temperature—are to be considered as of the first importance, while the contents of the *Pharmacopœia* occupy the position of auxiliaries whose services sometimes decide the battle, and at others are dispensed with without loss. Therapeutics to be successful must have a physiological basis. To give rest as far as may be to an inflamed structure is an old and wise maxim; and it is not less obvious, in regard to the system at large, that if a great channel of exit be obstructed the materials which therefore tend to accumulate should be sparingly introduced. The diet with albuminuria—save with that of lardaceous origin, in which the secreting power is until late but little impaired, while an exhausting discharge may have to be obviated—should be below the custom of health in its nitrogenous components. It may abound in milk and farinaceous matters, while fish may often take the place of flesh. The increase of albumen in the urine upon a too early resort to a meat diet is a common experience. With regard to liquids, it cannot be too strongly insisted upon that the functional strain upon the kidney is not to be measured by the quantity of water which filters through it, but by the quantity of mainly nitrogenous refuse which it has to convert and eliminate. Water, which probably transudes almost as through dead membranes, probably makes little demand upon the real secretive function. The worst kidneys indeed, those most hopelessly incapable of their special work, will

often discharge most of it. And it is easy to see that its passage is salutary both in the dilution of scanty and irritating urine, and also in washing out the solid products which, under the inflammatory process, collect mischievously in the tubes. A further use is to be discerned in this general law: the solids of the urine vary with its water. With given kidneys the solid excreta wax and wane with the bulk of the urine. Any means therefore—mere aqueous filtration as safely as any—which increases this will also increase the components of the secretion which are essential to life. With tubal nephritis, therefore, and scanty urine, an aqueous dietary, even with the addition of distilled water, or the element in some slightly sophisticated shape, will prove in every sense beneficial. In many, perhaps in most, cases of nephritis of tubal origin, these remedies of patriarchal simplicity—"spare diet, and spring water clear" are all that are needed to guide the disorder to its natural cure.

To this surest and safest of diuretics others must often be added, both to lessen dropsy and to avert the dangers of uræmia. The old rule is that in recent cases digitalis should be used; it seldom fails to increase the flow of urine, but I am not sure that it does not sometimes do so with some exasperation of the inflammatory action. The bitartrate and acetate of potash, which have a purgative as well as a diuretic effect, may probably be more safely resorted to. In chronic cases as much as can be done harmlessly by diuretics may be accomplished with scopolarium, nitre, and juniper. Cantharides and the more irritating agents of this class are generally distinctly injurious.

Perhaps, next to a regulation of the diet, it is most important to secure a daily and somewhat loose action of the bowels. Purgatives lessen the vascular tension, which in both acute and chronic cases, is a measure of their danger; and while it is not advisable too largely to divert the urinary fluids by severe catharsis, increased hardness of the pulse and other more obvious aggravations of the general state seldom fail to ensue upon constipation. When cerebral uræmia is threatening, hard purging by elaterium or otherwise is essential. As an habitual laxative a drug less used than it deserves to be—sulphate of potash,—given two or three times a day, in doses of from ten to twenty grains, is sometimes invaluable. It may be aided, if necessary, by Epsom salts or cream of tartar. This, or these, in their laxative action clear the obscured or blood-spotted retina and remove mists from the field of vision, slowly and not always completely, but in a manner which affords a remarkable contrast to the inutility of iron in this respect, and gives testimony as to the use of alvine evacuation in lessening the arterial tension of which such lesions are the index. The chronic headache of the granular kidney is often similarly and equally relieved.

While by such means the system is enabled to dispense, as far as may be, with the renal function, it must be asked whether, particularly in circumstances of recent inflammation, anything can be done directly towards the cure of the injured organs. Discarding counter-irritation as a method of punishing the skin for the errors of organs for which it is not responsible, it must be admitted that, beyond ensuring sufficient irrigation of the tubes, our chief endeavor is to provide the gland with leisure to cure itself. But it is worth men-

tion—especially in relation to a rapidly fatal form of nephritis, in which the tubes become widely sealed up, as if filled with molten glass, by a pseudo-croupous exudation of fibrine, the urine being almost suppressed, while the little that is passed is loaded not only microscopically, but, as a bulky precipitate, with large fibrinous cylinders—that all plugging of the tubes from this cause can be prevented by the administration of alkalies. Alkaline urine is a solvent for fibrine, and with this in process of secretion the exudation retains its fluidity, and whatever harm it is capable of doing by solidifying in the tubes is obviated. The experiment is easy of trial. However numerous fibrinous casts may be—and I need not say that this term comprises all that are usually passed,—they will, upon the alkalescence of the urine, quickly cease to appear, to return again with its acidity. There are cases in which such relief to the tubes must avert a pressing danger, but it is disappointing to recognise, as I fear we must, that the process of renal inflammation is seldom so simple as to admit of cure by this means.

I may say a word touching the use of iron. The impoverishing effect of albuminuria, possibly from the destructive action of the retained refuse upon the blood-corpuscles, produces a pallor which cannot but suggest this remedy; and in recovery from attacks of renal inflammation none is more helpful. But a medicine which is effective for good is generally, and in somewhat the same measure, effective for harm; and iron in chronic albuminuria needs to be administered with more discrimination than it, perhaps, always receives. With high vascular tension, such as belongs to the granular kidney, with a hard pulse for its sign, an enlarged heart, retinal mischief, and possibly persistent headache and nausea as concomitants, iron, however seemingly indicated by the look of the patient, is generally injurious unless most guardedly anticipated and counter-poised by aperients. The perchloride, among other salts, is often of especial service in dropsy; but where the vessels are not thus relieved and the symptoms which threaten are uræmic, this drug is generally better withheld. In any condition it seldom fails to do harm if allowed to constipate—a result which may be obviated by mixing the ferruginous salt with sulphate or bitartrate of potash.

In the treatment of granulation or lingering nephritis climate should take no secondary place. Every organ of the body, according to the teaching of ancient medicine, was subject to a separate planetary or celestial rule—a fancy which has at least this much of truth, that functional activity, and with it the liability to disease, are apportioned among the eliminating organs largely by external temperature or solar influence. In the tropics the stress falls upon the skin and the liver; in the temperate zone upon the lungs and the kidneys. The comparative exemption of the kidneys from disease, save of the lardaceous kind, appears, as far as our evidence goes—and the experience of our ubiquitous race makes it tolerably extensive,—to be common to the warmer latitudes; and the inference that under the same atmospheric influence chronic albuminuria, when not of lardaceous origin, would find perhaps, not organic cure, but at least systemic relief, has been amply justified by recent experience.

Not to dwell upon the treatment of cerebral uræmia, in which the uses of drastic purging and

forced diaphoresis are sufficiently well known as lessening the uræmic state, while means of controlling nervous irritability, the bromides, chloral and chloroform, are helpful as withholding its convulsive effects, I will say a word upon the less trite topics, the prevention and possible cure of the lardaceous condition.

This condition is one in which medicinal treatment would seem to be suggested by the nature of the morbid change, and encouraged by a tendency to natural recovery which the disease, even in an advanced stage, will sometimes exhibit. But with the curative power inherent in the human frame, not in this case, however, so often successful as might be wished, comes the ever-present vice of therapeutics, the attributing to art what belongs to nature—a possibility of error which will probably never cease to increase the confidence of the confident practitioner, and the distrust of him who, in one sense more foolish, is wise enough to doubt.

When the disease is consequent upon syphilis, iodide of potassium is of marked effect in lessening the organic enlargement and ameliorating its other effects. Sometimes, when a long-continued suppuration has come to an end, or greatly diminished, a retrogression in the resultant disease can be slowly followed, though no antidotal drugs have found place, if only the diet of the patient be liberal and his general surroundings favorable to health. The special remedy which pathology suggests, one which of late years I have used often and largely, is potash. I have found, in the first place, that under lasting suppuration potash salts can be given, not only without the depressing effects which sometimes attend their use, but to the improvement of the general health, and with the absence of lardaceous symptoms, which, in the circumstances of the case, would be at least a probable contingency. Further than this, I have given the salts of potash alone, or with quinine and iron, where visceral swelling, diarrhoea, and albuminuria have betokened the disorder in an advanced shape. Under such treatment the liver and spleen have become measurably smaller, the urine less albuminous, the patient has gained flesh and weight, and all the symptoms have ameliorated. But chemicals put into the stomach are not brought to bear upon the tissues as if the treatment of disease were conducted in a test-tube, and the cure is at best but a slow one. It is further obscured, or possibly simulated, by the shrinking which the swollen organs sometimes naturally undertake. The most striking instance of recovery under treatment which has come under my notice was one in which the disease was associated with syphilis, and the treatment correspondingly modified. Great enlargement of the spleen and liver, albuminuria, diarrhoea, and emaciation, gave evidence of the disorder in a degree of seemingly hopeless severity. Iodide of potassium was given, with potash and its vegetable salts. The patient was apparently cured; and on his death from an accidental cause, three years afterwards, the viscera has returned to their natural size and shape, and only such traces of the lardaceous change were discovered as to warrant the belief that he had once had more of it.

On the whole, reviewing my experience in this matter, I am bound to admit that the administration of potash by itself has proved, I will not say useless, but disappointing; less effective than pathological inference would lead us to hope.

As to the use of remedies of the restorative and tonic class—iron, quinine, and cod-liver oil—there is unequivocal evidence. If the deficiency of potash be connected, as I have ventured to surmise, with a loss or insufficient development of leucocytes, the disorder may perhaps be more appropriately met by means which promote their formation rather than by the mere introduction of material which, in the deficiency of these essential elements of nutrition, perhaps cannot be turned to vital purpose.

The measures I have commonly, and numerous experience justifies me in saying beneficially, used, have been liberal diet with beef-tea, Liebig's extract, and vegetables, all of which abound in potash salts, together with liquor potassæ, phosphate of potash, iron, quinine, and sometimes cod-liver oil. The alkaline remedies have been urged with the most advantage during the persistence of suppuration.

## A Clinical Lecture

ON

### TERTIARY SYPHILIS OF THE SOFT PALATE AND PHARYNX.

*Delivered at University College Hospital,  
Feb. 24th, 1876,*

By **BERKELEY HILL,**

*Professor of Clinical Surgery in University College,  
and Surgeon to the Hospital.*

GENTLEMEN,—There have been recently in hospital some cases of late syphilis of the palate and pharynx which exemplify the various ways in which that disease manifests itself in that region; and as I have been fortunate enough to obtain for you to-day several examples of these affections, it will, I think, be profitable to consider the morbid conditions more systematically than is possible when watching the progress of single cases in the wards or out-patients' room.

In passing, let me remind you of a peculiarity in the course of syphilis concerning the pharynx—namely, the rarity with which the pharynx proper is attacked in the early periods of syphilis. As you know, the anterior surface of the velum palati, the pillars, and the tonsils are constantly the seat of erosion, mucous patches, &c., while the eruptions are present on the skin. The larynx likewise is commonly affected in early syphilis. The pharynx nearly always escapes. The reason of this is not obvious, for there is no natural incapacity in the part; mucous patches and erythema are occasionally seen on the posterior wall of the pharynx. In searching for cases of tertiary pharyngeal disease, I came upon one case where a mucous patch was recorded to have been developed in the posterior wall of the pharynx during the early eruptive period. This is, however, the only one I recollect to have seen. Besides mucous patches in adults, in inherited syphilis, when there is coryza of the Schneiderian membrane, the pharynx is frequently reddened.

On the other hand, in the later periods of syphilis, when for the great majority of persons the disease is extinct, the pharynx is a chosen site for tertiary affections, and the ramifications into neighboring structures are often widely spread.

With regard to the time after infection that tertiaries appear in the pharynx, reference to my notes shows that a shorter interval is customary than is generally laid down in text-books. It is often difficult to obtain precise data on which one may rely for calculating the age of syphilis. In a remarkable case of aphasia from syphilitic disease of the brain, whom many of you may recollect to have seen frequently during 1874-5, the patient's pharynx was attacked four years after infection. Besides seven patients who are here to-day for your inspection, I have also collected nine cases from my female case-book for 1868 at the Look Hospital, in which the date of their infection and that of the beginning of their throat disease are clearly made out. Of the seven patients, in three the date of infection is probably long anterior to their throat disease; two are married women, and their syphilitic histories have for a chief symptom a long series of miscarriages and dead children; the third is a man, but though uncertain how long, he has probably been infected more than five years. In the remaining four, one was infected five years ago, and has had throat fourteen months affected; in another a circumscribed gumma began two years after infection. The remaining two patients are young, eighteen and ten years of age respectively, and their syphilis dates from infancy, being probably inherited. They are quite unaware when their throats were first affected, though certainly it happened several years ago. In the nine cases from the note-book—in one the disease began three years after infection, in four between four and seven years, in two more than seven years, and in the remaining two more than ten years elapsed between infection and the outbreak of tertiary in the throat. From these data it would seem that four or five years is the commonest period for syphilitic persons to become liable to gummous disease of the palate and pharynx, though it is not infrequent for their disease to begin sooner than that. Mark another point also in these cases. The early skin eruptions were ill-marked and transient, so fugitive in some that the patients had not noticed them at all. The man with a gap in the velum is quite unaware that he ever had a rash. All he recollects is a comparatively recent tertiary ulcer of the skin. I draw your attention to this character, because I believe it to be a frequent one in those who have tertiary syphilis of any kind, and probably has some influence in causing the tertiary proclivity.

There are two forms of gummy disease of the palate and pharynx: the *circumscribed* and the *diffuse*, or infiltrating. Their anatomical seat is the mucous membrane, the submucous or muscular layers. These different localities of origin cause some diversity in the symptoms and effects; thus they have a practical interest. The circumscribed and infiltrating varieties may be present simultaneously, though often only one is developed. This child, whose gumma of the forehead was so conspicuous two weeks ago, is an example of the diffused form. Her palate is seamed in all directions with the scars of an infiltrating gumma of the mucous membrane, which, not having penetrated the muscular tissue, has not greatly inter-

fered with the function of the part. This man, from ward No. 10, has a round hole in his palate, but now the edges are healed, the remainder of the palate being unaltered. He is an example of the circumscribed gumma. This woman, whose long history of miscarriages and dead children we extracted from her some days ago, has well-marked infiltrating gumma of the posterior wall of the pharynx and extensive implication of the bones of the nose and base of the skull.

The circumscribed gumma is the most common form, both in the velum and in the pharynx proper. It is usually single, though not invariably so. Owing to the insidious progress, it rarely attracts attention until it breaks by ulceration. If, however, a gumma is detected at an early stage, it presents a small, clearly circumscribed, solid mass, often almost globular in shape. In the velum, most frequent at the mesial line, near the hard palate, rarely at the sides, though I have seen it in the anterior pillars, and even in the uvula. In the pharynx there appears no predilection for the mesial line; there they form indifferently on any part. Beginning most commonly in the submucous or muscular layer, the great majority speedily spread to the other structures, and grow sometimes to a considerable size before they soften and break through the surface. Seldom larger than a cherry, they are recorded to have grown as large as a hen's egg. In such cases they have seriously impeded deglutition and respiration by their mere bulk. Fournier\* relates a case where a patient, having long had a "bad" throat, became at last quite unable to swallow, and breathed but with great difficulty. Nothing could be seen, but on searching the neck with the finger opposite the thyroid cartilage a swelling, apparently as large as a quarter of a lemon, could be detected. Presuming this to be syphilitic from the patient having had syphilis previously, he administered iodide of potash. In a few days the swelling was gone, and the patient could eat and breathe with perfect ease.

If untreated, sooner or later, generally in a few weeks, the tumour softens, and its liquid part escapes in the form of glairy viscid fluid, which is soon changed to viscid pus. Thus an ulcer is formed of circular or nearly circular shape, the surface irregular, hollowed; through its covering of adhesive pus project shreds of gummous tissue not yet detached, and irregular granulations. The edges of the ulcer are characteristic; they are thickened, raised, and reddish, forming often a kind of frame to the sore. Thus a large gap in the velum or a pit in the pharynx is produced, which is commonly increased by further conversion of the natural tissue into gummous tissue, and destruction by necrosis or phagedænic ulceration. But this is not invariable; instances are not rare in which the velum is perforated by a round hole, supple, and contracting or expanding readily by muscular action. If the gap in the velum is large, fluids, especially thin ones, escape into the posterior nares, and the voice assumes more or less of a nasal twang. But when the hole is small it often produces no perceptible effect on articulation, and the patient learns to compel the food to pass completely into the gullet. Less inconvenience than even this results from a circumscribed gumma in

\* Doyon's Annales de Dermatologie et de Syphilis. No. 4, 1873-4.

the pharynx, which, when healed, leaves only a depressed scar. The serious deformities of the palate or pharynx are produced by the infiltrating form which I shall presently describe.

When the gumma is developed on the posterior surface of the velum, or summit of the pharynx, it is rarely detected in an early stage, or until ulceration is far advanced. The symptoms that lead to suspicion of it are usually present to some degree: they are, dryness and discomfort of the pharynx, a frequent desire to clear the throat of a viscid mucus, which is less readily accomplished than usual, pain in swallowing, a humming in the ears when the gumma is situated near the Eustachian tubes, obstinate coryza, and, after ulceration has begun, pus and streaks of blood in the discharge from the nose. These symptoms get worse rather than better with lapse of time. But it often happens that considerable injury is caused before the nature of the disease is discovered. There was an interesting example of this kind last year in Ward 8, under the care of Dr. Wilson Fox, with whom I saw the patient on several occasions. The patient, giving no history of previous syphilis, complained of great pain in swallowing, dryness of the throat, and general malaise. Nothing could be seen in the throat except pallor of the velum, nor could anything be detected by the finger. While we were uncertain of the nature of her ailment, luckily for our diagnosis an iritis appeared in the left eye, which gave a clue to the origin of the throat affection. That, with the iritis, speedily improved when mercury was given, though not before the gumma became evident in the palate, and, breaking, left a permanent gap. I need not remind you that in searching for these gummata you should use the rhinoscopic mirror, and you may gain in that way ocular demonstration of the cause of the symptoms. But you will meet with patients whose fauces are too irritable to allow the velum to be lifted while the mirror is introduced. When this is so, if you take a broad bent spatula or spoon to draw the velum well forward, and while the head is opposite a good light, the greater part of the back of the palate and pharynx can be seen before reflex movement is roused. The palate appears to bear forcible displacement with a broad blunt surface more patiently than the gentle tickling of a small hook or the pinch of a forceps.

The *diffused* or infiltrating form develops in two varieties—that which limits itself mainly to the mucous membrane, and the severer variety which penetrates the submucous and muscular layers. The first leaves widespread seams and branching scars, the site of former creeping ulcers; but, the deeper layers having escaped, the organ retains its mobility, and apparently has undergone no detriment of function. The penetrating variety converts all it reaches into a tough, brawny, resisting tissue, and its progress is difficult to arrest before the whole velum and pharynx have been essentially altered in structure. At the outset the velum and pillars are much thickened, partly by the new growth, partly by oedema, which greatly hamper the action of the muscles. Soon the infiltration reaches the posterior wall of the pharynx, which, rendered thick and rigid, projects forward towards the velum, and greatly diminishes the cavity of the pharynx. A considerable surface is invaded before ulceration begins, but sooner or later the surface breaks, often at several centres, and a group of indolent uneven sores are formed, healing here

and spreading there, and covered with sticky muco-pus or diphtheritic exudation. The healing process is also peculiar. The rigid infiltration, so widely and deeply penetrating, is slowly transformed into a tough, highly contractile fibrous tissue, which replaces the normal tissue; its only covering being a brittle epithelium, that is readily chafed away into shallow indolent sores. The consequences of this slow conversion of the natural tissue into dense tough fibrous cicatrix are pain, deformity, and more or less loss of function to the organ.

Severe pain is seldom felt before ulceration with the isolated gumma; here, on the contrary, pain begins very early, varying in amount with the situation of the morbid process. When the parts are at rest there is little pain, but speaking more than a few words brings a sense of fatigue from the impediment or muscular contraction. The voice is thick and husky at first, becoming, when contraction is advanced, hissing or hoarse, like a drake's; and, owing to the difficulty of swallowing, the patient is continually hawking and spitting out a thick glue-like mucus. Swallowing inflicts most severe pain; solids after a time cannot be swallowed at all, and then liquids with great difficulty.

But these calamities are not the worst that may befall the miserable patient. The infiltrating new growth may spread to the posterior nares, destroying the mucous and periosteal lining of the delicate bone, causing either necrosis of large pieces or destroying them by syphilitic osteitis. In this way, the bones of the nose, of the palate, of the sphenoid, of the basilar part of the occipital bone, the bodies of the upper cervical vertebrae, may be cleared away. Thus the brain or the spinal cord may be seriously and fatally affected. Sometimes the infiltration and consequent phagedæna reach a large bloodvessel and occasion sudden dangerous hæmorrhage. There is another effect produced by the contracting scars: the remnant of the velum becomes adherent to the roof of the pharynx. Usually there is left a gap in the centre, large enough for the forefinger to enter, by which communication between the nose and the pharynx is still possible. But sometimes this aperture is very small, or even entirely closed, when of course air can reach the lungs through the mouth alone. At other times the greatest deformity is in the fauces; the isthmus is replaced by a gristly ring much narrower than the natural mobile yielding sphincter, and which draws up and holds the root of the tongue and epiglottis, or the remains of that structure, in an almost immovable position. It is difficult to exaggerate the constant suffering this entails.

A few words on the treatment of these cases. This resolves itself into curing the general cachexia, and allaying the local suffering. The iodides of potash, soda, or ammonia are the chief resources. In most cases you have merely to begin with moderate doses of iodide of potash, and gradually increase them by adding one-third to the dose every three days as long as the gummata are not absorbed, and, the ulcers unhealed. As soon as they are healed the iodide may be lessened, and, after a few weeks, omitted for a time altogether. But, unfortunately, there are patients who cannot take iodide of potash in sufficient doses, or even at all, without being iodised. Most of these patients nevertheless can be brought to bear iodine if it be given in a way suited to them. Sometimes the



iodide of soda is borne when the potash salt causes intolerable depression, and both are more efficacious when they are taken with carbonate of ammonia. Sarsaparilla also will afford tolerance for large doses. The time at which the medicine is taken is of importance. The stomach can bear a heavier dose when full of food than when fasting. Again, a large dose can often be borne at bedtime if drunk with effervescing water. Perhaps the effervescing carbonic acid soothes the stomach until the iodide is absorbed. When neither iodide of potash nor iodide of soda is tolerated, there is still the iodide of ammonia, which, being wholly volatile, probably undergoes complete decomposition, and affects the blood less injuriously than do the large quantities of fixed alkali which are combined in the other iodides. But this salt is very unstable, decomposing in even watery solutions, and still more readily in vegetable infusions. Hence, when given an excess of sesquicarbonate of ammonia must be added to the solution. With this precaution this iodide will sometimes succeed when the others have failed. As an antidote to syphilis it is, I believe, identical with them in its effect. The next drug in order is mercury. Indeed, though it is advisable to delay the administration of mercury until the iodides have driven away the gumma, healed the ulcers, and restored the patient's strength to some extent, mercury should always form a part of the course. When iodides cannot be borne, try mercury at once; and in these debilitated persons the least injurious way is by inunction. Every evening twenty grains of the strong mercury ointment should be rubbed into the skin. This may be done also while the iodide is continued. If given by the mouth, a suitable dose is three-quarters of a grain of the green iodide of mercury as a pill daily at breakfast-time; or one-sixteenth of a grain of cyanide or bichloride of mercury in a pill, with a sufficiency of sugar of milk, every four or six hours, is also an efficacious way of bringing the patient under the influence of the drug without distressing the stomach. Indeed I have found that mercury, like some other medicines, is more effectual in small frequent doses than in large doses at long intervals. The disadvantage of frequent doses lies in this: the patient is apt to forget some of his pills when he has several to take in the course of the day. He can manage one night and morning, but the intervening doses are often omitted. When the patient has been fitted with the form of antidote, whether of iodine or mercury, which he can absorb, his recovery may be assisted or his suffering relieved by opium, also in small frequent doses, and strength be given by iron, quinine, or cod-liver oil. He will need suggestions for supplying himself with nourishing food that he can swallow; such must be chiefly strong soups thickened with arrowroot, milk similarly thickened, jellies with wine in them, and such easily-swallowed solids. That well-puffed article of food, revalenta arabica, prepared with milk, is an excellent kind of food for these patients. It is not a starch, but chiefly a very purely-prepared flour of lentils. Much alcohol is hurtful, by hindering the absorption of mercury or iodide. Then as to local remedies: caustics must be avoided, they cause pain when they reach the ulcers, and don't arrest the phagedæna; general treatment must be trusted for that. Assiduous sponging with soothing lotions are the most successful. Weak solution of borax with a little

glycerine, steam with kreasote vapor, or a solution of bichloride of mercury, with one-sixth of a grain of mercury to the ounce of water, when there is great soreness and consequent spasm, are most useful. Frequent washing with the nasal douche is of great service to clear away the mucus and discharge of the nares. The gaps that are left are not promising for plastic operation. The tough cicatrices of the infiltrating variety should never be sutured. Very tight bands may sometimes be cut across, but even then the resulting scar often shrinks almost as much as it had at first. Plastic operation may be attempted to close a gap in the palate left by the breaking down of a gumma when the neighboring tissue has lost little of its natural suppleness. But it is in nearly all cases best to wait until the contraction which follows cicatrization has finished, and to close the diminished orifice with an obturator, which dentists now fit with great skill and success.

## Clinical Lecture

ON

### GELATINOUS DISEASE OF SYNOVIAL MEMBRANE.

(NEW OPERATION.)

*Delivered Jan. 18th, 1876,*

By C. F. MAUNDER, F.R.C.S.,

Surgeon to the London Hospital.

GENTLEMEN,—I propose to-day to draw your attention to a disease which is very common under the age of puberty—I allude to gelatinous disease of the synovial membrane, popularly called "white swelling" when met with in the knee, but to which all joints are liable. It will be convenient to observe its progress in this joint because it is comparatively superficial, and its condition can therefore be readily appreciated by the senses of sight and touch. The onset and early stage are illustrated by the following case (reported by Mr. John Job, house-surgeon).

John L.—, sixteen years of age, was admitted under Mr. Maunder's care on Nov. 30th, 1875. The patient states that until twelve months ago he was quite healthy; he then, one day, slipped from a ladder, and, in falling, caught his right leg between the bars. In this position he was suspended for two or three minutes. The accident caused him very trifling inconvenience at the time, and it was not until the following day that he noticed the knee to be swollen and stiff; but there was no acute pain. He did not rest the limb, but followed his occupation, that of a ploughboy, as usual. For six months, beyond a feeling of stiffness and an occasional sensation of heat, there was little to trouble the patient; his general health was good, and he slept well. Then the joint began to get painful, and he was obliged to give up work, and use a stick in getting about. He then came to the hospital. On admission, the patient, of light complexion and fairly nourished, said he had got

thinner since the accident. The right knee was uniformly swollen, the natural elevations and depressions being concealed. It was hotter than the surrounding parts. To the touch the swelling was elastic, yielding a deceptive sense of fluctuation, and tender on pressure. The leg was slightly flexed, with inability to straighten it. Slight wasting of limb. Family history very good.

The history of this case then is often the history of many others: some slight accident, of which little notice is taken at the time, and which probably is never thoroughly recovered from. At the same time there are many instances in which it does appear to be spontaneous or of constitutional origin. From this point of view it is called *strumous*, a term which I understand to apply to a subacute or chronic form of inflammatory action tending in the direction of extensive cell-growth, degeneration, and suppuration (occasionally to fibrination), rather than to resolution. The disease affects two classes of patients indiscriminately—the delicate and the fair, with chiselled features, clear complexion, pearly sclerotic, and fine hair; the plain and unattractive, with ill-defined lineaments, thick skin, and coarse hair. Now this is very different to a scrofulous disease consequent on tubercle, and must not be confounded with it. Pathology tells us that the altered condition of the knee (for example), which had caused the absence of its natural hollows and elevations, is due to a mass of cells growing, some on the surface of the synovial membrane and towards the joint cavity, and others in the subsynovial tissue, and to such an extent as to encroach upon and even obliterate the joint-cavity, and to conceal the natural outline of the joint and to render it shapeless. Now these cells, when examined by the microscope, have all the appearance of granulation-cells, and, like them, under favorable circumstances, will become developed into fibrous tissue. Unfortunately, in the majority of instances, the patient not being strong, degeneration follows, and suppuration is established. Thus, a joint, remaining more or less swollen and stiff, becomes hot, tender on pressure, and painful after exercise. At the same time the ligaments are invaded and disappear, the articular cartilages degenerate, the bone becomes carious, and sinuses are established in one or more directions, as in the preparation before you, and often in accordance with gravitation, in order that the pus and other debris may be discharged. While these destructive changes are taking place the hamstring muscles displace the leg backwards and rotate it outwards, both shortening and distorting the limb, and possibly to be followed by either amputation or excision. Happily, in many instances, the degree of disorganisation which I have mentioned does not transpire, but a fibrous ankylosis, more or less complete, occurs. Two such cases have been recently under care, and left the hospital last week convalescent.

Charlotte B—, aged six years and a half, admitted Sept. 28th, 1875. The mother stated that the child struck the left knee three years ago, when it became swollen and stiff and ultimately painful, and remained so for a long time. She had a doctor for it, who called the disease "white swelling." The child is fairly nourished, somewhat anæmic, has dark hair and eyes, and is very intelligent. On examination, the left lower extremity is much wasted, the leg, which is somewhat displaced backwards and rotated outwards, forms

with the thigh, when fully extended, an angle of 115°. The patella is immovable and fixed to the lower part of the outer condyle of the femur.

The case of Alice F—, eleven years of age, is almost similar in every particular. She fell and struck her knee five years ago; it gradually became swollen and stiff, but there was very trifling pain. She had never kept her bed.

You will recollect that these are the two instances in which, to remedy a deformity consequent on ankylosis of the patella to the femur, I performed a subcutaneous operation. With a tenotomy-knife alone in one instance, aided by a saw in the other, I separated the patella from the femur—an all-important step,—to promote extension of the leg. No discomfort whatever, no suppuration, followed the operations, and both children left the hospital last week greatly benefited.

This preparation which I show you, where the patella is fixed to the femur by fibrous ankylosis, while the tibia is somewhat displaced backwards, is in a condition similar to that in which the joint of each of those children was previous to operation. You will readily perceive that a patella so fixed is a direct mechanical obstacle to extension of the tibia upon the femur, and that it must be dislodged before that can be effected. The operation which I have suggested, and which you have seen me perform twice, had this object in view. In one case 45° of extension was gained by the operation, and the child gets about comfortably with a high-heeled boot.

In these two cases the granulation-cells, instead of degenerating into pus, were converted into fibrous tissue, as in a cutaneous cicatrix, leading to a firm union of the patella to the femur, but to a weak union of the latter to the tibia.

*Prognosis.*—This, you will at once see, is unfavorable, as the disease is rarely arrested, leaving the joint sound. This gelatinous disease of the synovial membrane may be conveniently divided into two stages. The *first* is characterised by *cell-growth*, while the *second* is illustrated on the one hand by the *adhesive*, on the other hand by the *suppurative* form of inflammation. Of these latter the adhesive is the least to be feared, while the suppurative is of grave significance, because the necessity either for excision or amputation may arise during its progress.

*Diagnosis.*—The chief symptoms are (following or not some slight accident)—stiffness in the morning, causing limping, mechanical in its nature, due to the swelling; gradually passing off on using the limb; associated at first with painless swelling; to be attended by tenderness and pain, not necessarily obliging the patient to lie up, unless suppuration, "starting pains," &c., arise.

All these cases illustrate the insidious and comparatively painless nature of the malady even to ankylosis, neither of the girls having kept her bed.

*Treatment.*—Good diet, change of air, and tonics, including preparations of iodine, are indicated by reason of the chronic nature of the complaint, implying a serious constitutional error. Perfect rest to the joint must be ensured by splints, with an occasional counter-irritant in the shape of a flying blister; and when heat and tenderness have nearly subsided, strapping and bandage, to support the cell-mass and prevent venous congestion, must be applied. When all danger of resuscitating inflammation appears to have ceased, frictions and passive motion will much avail. Thomas's

splint, such as I show you, as used by one of the above children,—with a patten attached to the boot of the sound foot, will allow the patient to take exercise in the open air, will promote extension, and yet secure a certain amount of repose to the joint.

*Tenotomy.*—You will have remarked that, of my three cases, in that of the lad the disease is in its first stage, while in the two girls the malady has terminated in ankylosis with deformity. Now, as prevention is better than cure, I would suggest, as a rule of practice, that an attempt be made to prevent that deformity that you have witnessed in these children by a subcutaneous section of one or more hamstring tendons—at any rate the biceps, the power of which to rotate the leg outwards you can readily appreciate on your own person. I adopted this plan in the case of a child of a professional friend, and I believe with marked benefit. I propose to do the same in the instance of the lad above mentioned.

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## Original Papers.

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### ON GELSEMINUM SEMPERVIRENS.

(Continued from June No., p. 263.)

PRELIMINARY ACCOUNT OF EXPERIMENTS RELATING  
TO THE ACTION OF EXTRACT OF GELSEMINUM  
ON THE RESPIRATORY MOVEMENTS.

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Professor of Physiology at University College.

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In previous papers it has been shown that gelseminum exercises a very remarkable influence on the function of respiration, and that when the drug is given in fatal doses death takes place, as in poisoning by curare, by gradual arrest of the respiratory movements. Facts have also been referred to which plainly indicate that this result is not, as in the case of curare, to be attributed to suspension of the functions either of the motor nerves or of the muscles to which they are distributed, so that the conclusion can hardly be avoided that this agent exercises its influence directly on the cerebro-spinal centres, and particularly on those parts which preside over the rhythmical respiratory movements.

Before proceeding to relate the results of experiments made for the purpose of investigating the nature of this influence, it may be useful to place before the reader some statements as to the mechanism of what may be called the respiratory nervous system.

It is one of the most important results of the investigations of the past thirty years in relation to the physiology of the nervous system, that each of the combinations of muscular movements by which the great mechanical functions—viz., respiration, circulation, &c.—of the organism are kept going independently of the will or contrivance of the individual, is under the control or direction of a so-called "motor centre," from which emanate those outgoing channels of influence by which the mus-

cles concerned are brought into harmonious action for the effectual carrying out of the function, and towards which those afferent channels converge, by which the centre is itself brought into relation either with the outside world or with other parts of the nervous system.

Of these centres some act automatically, others excitomotorially: by these expressions it is meant that in some instances the centre issues its commands from time to time to the muscles over which it presides, independently of any impression or influence received from outside through afferent nerves; whereas in others, although the centre acts independently of the mandates of the will, it exerts itself only when it is awakened to action by some stimulus of external origin.

Of the automatic centres, that which presides over respiration is one of the best examples, not only because we have very precise knowledge as to its anatomical situation in the floor of the fourth ventricle, but because the experimental evidence that its action is purely automatic, and not reflex, is clearer and more conclusive than that which can be given in respect of any other similar structure. For it has been shown by the most conclusive experiments that so long as the respiratory centre is supplied with blood which is sufficiently arterialized, and is in communication by motor nerves with the muscles over which it presides, it continues to discharge itself rhythmically towards these muscles, so as to determine that orderly combination of movements of which respiration consists, notwithstanding that all possible channels of extrinsic influence have been cut off.

In addition to this fundamental fact of the pure automatism of the respiratory centre, there are others which must be borne in mind in order to a proper understanding of its function. The first of these is the remarkable relation between its functional activity and the quantity of oxygen (in the form of oxyhæmoglobin—i.e., in combination with the crystalline coloring matter of the blood) which is supplied to it, which is of such a nature that respiration diminishes or (as is the case in most animals) ceases as the blood approaches the condition of complete saturation with oxygen; while, on the other hand, when the quantity of this gas held in combination by the blood-corpuscles becomes defective, the activity of the respiratory movements increases more and more until, as in asphyxia, the functions, not only of the respiratory centre, but of other essential parts of the nervous system, become so disordered and impaired that the continuance of systemic life is no longer possible.

A second fact relates to the channels by which the centre acts on the individual muscles which take part in the respiratory process. In man and many other animals, the only muscle concerned in ordinary tranquil breathing is the diaphragm. As respiration becomes more active other muscles—e.g., the intercostals, the scaleni, the external laryngeal muscles, &c.—come successively into auxiliary action. All of these act in respiration under the direct control of the centre, with which all must therefore be in direct communication by motor nerves; but the facility with which the centre discharges its influence towards these several muscles is evidently very different. Under normal conditions its area of influence is limited to the diaphragm, or at most to that muscle and to the intercostals; but as its supply of oxygen dimin-

ishes, this area, step by step, extends to an increasing number of muscles, as is familiar to everyone who has had the opportunity of watching a human being or an animal in the successive stages of dyspnoea. We can explain this in one way only—namely, by supposing that the channels of discharge leading to different muscles offer very different degrees of resistance to its passage.

There is, however, another fact which must not be overlooked. Although, as has been already stated, the respiratory centre possesses in itself the power of absolutely independent action, provision is made in its structure of a most remarkable kind for subjecting it to the modifying influence of external conditions, and particularly of conditions existing in the organs over which it presides. By means of a special nerve—the respiratory vagus (the term which may be designated those afferent fibres of the pneumogastric which are distributed to the air-passages)—the centre is constantly affected by the varying conditions of the respiratory organs in such a way that the relation which is thus maintained between the two parts (centre and organ) can only be spoken of as regulatory or compensatory, and cannot be compared with that which exists between a sensory surface and a reflex centre in the ordinary case of so-called reflex action. For here the influence which passes from lung or bronchial tube to centre has no tendency to excite motion, but the contrary; its nature being such that—being comparable to that of a bridle, not to that of a spur—it can only be called inhibitory or regulatory. As to the nature, and still more the final cause, of this singular action of the respiratory vagus, although a great deal more is known than has here been pointed out, we have unquestionably much to learn.

As to the power which the respiratory centre possesses of automatic rhythmical action; in the peculiar relation which we have seen to exist between sensitivity and the varying proportion of oxygen taken in combination by the hæmoglobin of the blood; in that fine graduation of its channels of discharge, whereby it is enabled to widen its range of influence according to the requirements of the organism; and, finally, in the regulatory mechanism by which it is kept constantly *en rapport* with the means of which it directs the movements,—we have a series of endowments which completely fit it for its function, and afford us a satisfactory explanation of all the phenomena of tranquil or exaggerated breathing so long as the normal rhythm is maintained.

There are, however, many well-known instances, both in health and in disease, in which muscular action which are in effect respiratory are performed, in the understanding of which the mechanism of automatic respiration gives us no key. Of these many are unquestionably reflex—such, for example, as the inspiratory gasps which are induced by the sudden application of cold to the surface, or the sudden contraction of the diaphragm, which is the initial act of the complicated reflexes of vomiting, coughing, and sneezing. Other instances come under our knowledge experimentally in which sudden contraction of the diaphragm can be evoked by excitation of afferent nerves and particularly of certain afferent fibres contained in the vagus. All of them are, as I have said, in effect respiratory, for they result in inhalation, followed by expulsion, of air, but differ from normal respirations quite as much in their *mode* as in their origin. It

is, I believe, characteristic of all reflex inspiratory acts that they are of extremely short duration, and that they are so immediately followed by expiration, that the latter seems, as it were, to cut short the former before its completion. For this reason, the English word *gasp*, in its ordinary and well-understood acceptation, fully comprehends the conception of reflex inspiration. The act of vomiting may be truly said to begin with a *gasp*, immediately followed, and as it were cut short, by contraction of the muscles of the abdominal wall; and so of the other instances. Another characteristic difference between the *gasp* and the rhythmical respiration is that in the former the auxiliary muscles of respiration do not take the same part as in the latter. In its simplest form the *gasp* consists in a spasmodic contraction of the diaphragm, differing in the most striking way from the deliberate manner in which that muscle draws its central tendon downwards in ordinary breathing, its fibres remaining in the shortened state during the whole of the respiratory pause. In other instances (whether from greater intensity of excitation or greater excitability of centre) the purely diaphragmatic *gasp* extends itself over a wide range of muscular actions, but the muscles thus brought into play are not those of inspiration. We have the best example of this in the well-known gasping inspirations which characterise the second stage of asphyxia, in which we see that each contraction of the diaphragm is but the starting-point of a general convulsion affecting the whole body of the asphyxiated animal, of which the most obvious character is expressed by the term usually given to it, “stretching spasm,” for the muscles chiefly affected are the extensors of the trunk and limbs.

The space at my disposal will not permit me to enter so fully into this subject as I should like. It will be sufficient for my present purpose if it is understood that the automatic is distinguished from the reflex respiratory act—the *sigh* from the *gasp*—by well-marked characters. The two muscular actions have this in common. In both instances the combination of muscular movements is “led off” by the diaphragm, but the combination itself is so entirely different, that there can be no doubt that the co-ordinating centre from which those impulses originate which manifest themselves in spasmodic respiratory acts, whether accompanied with “stretching spasms” or not, is entirely different from that which regulates the rhythmical motions of ordinary respiration.

The preliminary experiments on which the following statements are founded were made for the purpose of investigating the influence of gelseminum on the movements of the diaphragm. This was accomplished as follows:—The animal (rabbit) employed having been narcotised by chloral, a small spatula (shaped like the handle of a teaspoon) was introduced into the peritoneal cavity through a small opening in the linea alba, and passed upwards in front of the liver until its convex surface rested against the under side of the centrum tendineum. The stem of this spatula was brought into connexion with a lever, by means of which its to and fro movement, and consequently that of the diaphragm, was inscribed on the cylinder. By this means graphical records were obtained of the diaphragmatic contraction before, and at successive intervals of three minutes after, the injection into the venous system of a fatal dose of gelseminum

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could not have been distinguished from one of the second stage of asphyxia. The record (Fig. 7) affords evidence of complete abolition of the normal element, but even here it could be seen, by watching the laryngeal movements, that the automatic centre was not entirely paralysed; for its ordinary mandate, though it was neglected by the vagus, was punctually obeyed by the posterior crico-arytenoid muscles, which at the proper moment opened the glottis, fruitlessly of course, with the same precision as ever. As the expiratory closure of the glottis was immediately preceded by the spasmodic inspiration, it is obvious that this happened at a moment which, if respiration had been normal, would have coincided with the expiratory pause.

Further discussion of these facts must be reserved for a future paper. For the moment it will be sufficient to state that the drug acts on the respiratory function by paralysing the automatic respiratory centre; but that the process of extinction of the respiratory movements, which might otherwise be expected to be gradual and progressive, is prevented from being so by the intervention of disturbances of which the explanation is to be found in the imperfect arterialisation of the circulating blood.

### CHEIRO-POMPHOLYX.

*Notes of a Clinical Lecture on "a Recurrent Bullous Eruption on the Hands," written out in April, 1871, and, now printed verbatim.*

By JONATHAN HUTCHINSON, F.R.C.S.,

Surgeon to the London Hospital and to the Blackfriars Hospital for Skin Diseases.

THE hands are liable to an eruption of vesicles which occur under somewhat peculiar circumstances. Slight forms of the malady which I have sought to describe are tolerably common; severe forms are rare; and cases rising to the severity which the disease assumed in Miss G——'s case are extremely infrequent. I have never seen a case which paralleled this; but I feel sure that it differs from others in degree only, and not in kind. The most severe forms which I have seen have been in women, and usually in association with a highly nervous temperament. The eruption appears to be characterised by rapid and local development, by tendency to spontaneous cure, and by liability to recur over and over again in the same individual. The hands are the parts first affected; the feet come next; and in a few instances a rash appears over the whole body. In the majority of cases the hands alone suffer, and in all they are the parts most severely affected. A tendency to spontaneous absorption of the fluid contained in the vesicles or bullæ, even when the latter are very large, is a very remarkable feature. I think that the disease must certainly be regarded as a neurosis. It is not connected with any local cause, nor is it influenced by local treatment, nor have I ever seen any reason to suspect that it depended upon articles of diet or upon any drug which had been administered.

The eruption in question begins with intense burning and itching on some part of the hand, usually between the fingers. After a short time—a few hours or a day or two—there are seen, deeply placed in the skin, small accumulations of clear serum, looking like sago-grains. These are perfectly transparent, and not unfrequently resemble the vesicles of scabies sufficiently to excite suspicion. They differ, however, from those of scabies in being much more deeply placed, having flatter tops, in being usually closely grouped instead of scattered, and in the entire absence of burrows. The itching and burning are very similar in the two. After a few days, in almost all cases, these vesicles dry up, and the disease is at an end, although probably a little inconspicuous desquamation of epidermis will follow. The disease in this mild form is so common that I suspect almost everyone will recognise its description. Many have probably had personal experience of it. In some it occurs during hot weather; and, now and then, violent exertion may have seemed to produce it. But in most instances no cause for its occurrence can be assigned. Those who have had it once will very probably have it again; and several of the facts in its clinical history coincide pretty nearly with what is true of herpes of the lips and herpes of the prepuce. I do not recollect ever to have seen a well-marked example of it in a patient under the age of puberty, nor in a very old patient. All that I have seen have been young adults or in middle age.

It will be noted that the remarkable tendency to speedy and spontaneous disappearance, leaving the skin quite sound, supplies a feature of positive difference from eczema, of which the indefinite duration and the tendency to persist and become aggravated are such marked characters.

Many authors have, in their description of the forms of eczema of the hands, used terms which apply to some of the symptoms of this disease; but I am not aware that anyone has drawn attention to its distinctive features—symmetry, spontaneous cure, and liability to relapse.

CASE 1.—Mrs. C——, aged twenty-five. The eruption began to come out on April 10th (on the left hand), and was accompanied by great itching. It has gradually increased since.—*Present condition* (April 15th, 1871): The palm of the left hand and the palmar aspect of the fingers and thumb are covered with closely packed vesicles of various sizes. Most of the vesicles seem deeply placed, contain clear fluid, and give a shotty feel to the finger. They are not arranged in lines, show a tendency to run into one another, and there are no burrows to be seen. Over the ball of the thumb the vesicles are more distinct and more elevated. In the palm itself, longer, irregular elevations of the skin occur. The whole surface somewhat resembles blistered steel. The back of the hand is not so much affected, the fingers only having suffered. Between the fingers the eruption is copious, and consists almost entirely of small elevated pearly vesicles, varying in size most remarkably—from that of a pin's point to that of two pins' heads. The whole hand and fingers are much swollen, but this is most perceptible on the back of the hand; the swelling is so great that she has been obliged to cut her wedding-ring. The eruption is now attacking the lower fourth of the front of the forearm. The right hand began to be attacked this morning. There is a broad band of vesicles

passing from the hollow of the middle of the wrist in a curved direction around the base of the ball of the thumb to the root of the index-finger. There is a small group on the front of the outer border of the base of the thumb, and another between the little and ring fingers. There are some on both sides of the thumb and on both sides of all the fingers. The ulnar border of the hand is scarcely at all affected. There is no swelling of the right hand. She complains much of "burning like fire" in the left hand and of itching in the right.

She considers herself to be nervous, easily frightened and surprised by sudden noises &c. Says she has never had "hysterics." She is married, and has two children, the youngest two years old. Menstruation regular. Last Saturday, whilst at marketing, she held a yellow leather purse in her left hand. The purse was of a bright yellow color, and the dye came out on the skin; the color has remained ever since, although she washed her hand as usual for two days after Saturday. She had had the purse two weeks at that time, but had not before held it in her hand so long.

CASE 2.—Miss G— is now aged forty-three. She has been liable to the eruption I am about to describe for the last twelve years. She is of fair complexion, spare development, and highly nervous organisation. When well she is of active habits, but for the last twenty years nearly half her time has been taken up with ill-health. She has never been positively hysterical, but the peculiar nature of her maladies has often led her friends to suspect exaggeration. About the reality of her skin eruption and its severity there can, however, be no sort of doubt, and it is but reasonable to allow it to give support to her statements as to suffering in connexion with less obvious maladies. Her main complaint is of a kind of hyperæsthesia which causes her to ache all over, and which renders her unable to touch anything or to encounter the slightest pressure without pain. Thus, when at the worst, she can neither sit nor lie in comfort, and cannot permit her arm to rest for a minute on the table without its causing the skin to become extremely painful. At her best she is a good sleeper, but when the hyperæsthesia is on she is prevented from resting by the impossibility of finding a position which is comfortable for more than a few moments. This condition is attended by an irritability of manner, a proneness to dwell upon her complaints, and a tendency to attach importance to seemingly little things, which have caused her friends some anxiety as to whether her ailments might end in mental disturbance. When ill she is indisposed for exertion, and much depressed in spirits. She is herself under the conviction that place of residence has much to do with her disorder, and that she is always worse when living in a damp and chilly air. She has varied her residence frequently, and often with apparently great benefit; but, on the other hand, attacks have come under very various circumstances.

There is nothing special to be said as to family history. Her parents are both upwards of seventy, and in good health, and none of her numerous brothers and sisters have had any form of nervous disorder.

It is about twelve years since Miss G— first became liable to a severe eruption on her hands and feet, and she has had about ten attacks of it. At first a year or two would occur between the attacks, but lately sometimes two have happened in

six months. There was nothing special in the first, and its cause could not be conjectured. Usually she experiences premonitory symptoms, such as a general sense of discomfort, with burning of the hands and feet, for a week or two before the eruption comes out. Then deeply-placed effusions of serum occur under the epidermis of the sides of the fingers, producing the appearance compared to sago-grains. With this there is general redness of the palms and soles, and great burning and itching, with sense of stiffness. In a few days the vesicles develop and coalesce, and at length numerous bullæ are formed, looking much as if liquor vesicatorius had been used. At the time that the hands are thus affected there is usually a red lichenous rash over the whole body, which varies much in color at different parts of the day, which never passes into vesicles, but which always causes subsequent desquamation. The feet are always affected in a much slighter degree than the hands, and no vesicles or bullæ ever show themselves on other parts.

I first saw Miss G—'s eruption in consultation with Dr. Ransome and Dr. Marshall Hall Higginbotham at Nottingham. The condition in which her hands then were has been very accurately delineated in the accompanying drawing by Mr. Burgess, whom we sent over for the purpose. The bullæ were so precisely like artificial blisters, and so unlike any ordinary form of skin disease, that the doubt suggested itself to most as to whether they could possibly have been produced intentionally. This doubt I set at rest by proposing quite unexpectedly to her to examine the feet also, when we found on them, not large vesications, but a few scattered and small vesicles, which were symmetrically arranged, and could not have been artificial.

Further proof of the genuineness of the case was afforded when I had, six years later, the opportunity of watching her through another attack. It should be added that the eruption is often attended by follicular sores in the mouth. The rash on the hands is transitory, and that on the hands and feet never remains more than a few days at its height. If the vesicles are not pricked the serum will be removed by absorption, and the epidermis, much thickened and discolored, will return again into position. If the bullæ are pricked superficial exoriations result, but no scabs or crusts ever result. The hands, in the course of three weeks or so, are restored to their natural condition. The nails, as might be expected, show deep furrows across their surfaces as the results of the attacks. No treatment has ever appeared to much influence the attacks. Miss G— has consulted many medical men and has taken arsenic and many other drugs without material benefit to her health. In 1869 Miss G— had a fever, and was very ill. After it for six months her health was unusually good. At Christmas, 1870, she had a moderately severe attack of the eruption. It did not come out so freely as usual, and after it the health did not improve. She remained through the first two months of the year still feeling ill and uncomfortable, and in March whilst staying in London her enemy again made its appearance, and she went through a severe attack. The eruption on the hands lasted about ten days. It affected, as it had previously done, the thumb and radial fingers much more severely than the ring finger and little one, the last indeed was almost exempt. Miss G— has never had rheumatism, and it may be noted as an inter-



eating point that she is not liable to colds, and does not know what a bad cold in the head is. Do the explosions of eruption take the place in her of the bad periodic catarrhs to which many are subject?

**CASE 3. Bullous eruption on the hands, relapsing through thirty years and occurring on no other parts, and usually undergoing spontaneous cure.**—Dec. 13th, 1867: A married woman, apparently in good health, attends on account of an eruption on the palms of the hands and between the fingers. The eruption comes out as large vesications, some of them as large as shillings, and with a certain amount of inflammatory swelling of the whole hand, back and front. The vesications quickly break and dry up, and leave large denuded patches like those of psoriasis palmaris. In the palms of the hands these patches could not be distinguished from psoriasis palmaris, but on the fingers they are more like eczema. On the sides of the fingers there are numerous little minute vesicles, which tend rather to dry up than to break, and resemble those which we have previously described in other cases in connexion with nervous disturbance, &c.

Her history is that she has been liable to the eruption for thirty years. The first attack was at the age of twenty, two years after her marriage, and she has had numerous attacks at irregular intervals since. She has attended twice before at this hospital (Skin Hospital), the last time four years ago. She has not observed any connexion of the attacks with lactation. She has had a family of fourteen children, of whom nine are living. The attacks do not appear to have been connected with any special time of year. She complains that when the eruption comes out she is usually very low-spirited. When the attacks are slight, they get well spontaneously, but on several occasions they have lasted two or three months, and required treatment. It has never occurred on the feet, and has never passed higher than the wrists. She lives at Hackney. Ordered mixture of arseniate of potash, one drachm three times a day, and mercury-and-lead ointment.

Syphilis may simulate all varieties of skin eruption, and now and then, I believe, one closely resembling this in some of its features occurs in connexion with this cause. But there are marked differences in the clinical history. Although the vesicles come out on the fingers, and itch intolerably, and although they look exactly like what I have described, they do not disappear so quickly—indeed, they may persist for months. It is exactly so in the very rare cases in which an eruption like herpes zoster is produced in connexion with syphilis; such forms of herpes are persistent, not transitory. The best-marked example of bullous eruption on the hands from syphilis which I have ever seen occurred to a German gentleman of middle age, who had undoubtedly had syphilis. For many months crops of these vesicles kept coming out on his hands, so frequently that he was rarely free from them. He had been in the first instance treated for scabies, but with no benefit. The eruption never appeared on other parts, and after a long anti-syphilitic treatment he got well.

## ON THE DETECTION OF STONE IN THE BLADDER.

By W. F. TEEVAN, B.A., F.R.C.S.,

Surgeon to the West London Hospital.

THE detection of stone in the bladder is a subject of lasting interest and importance, and as from time to time errors have occurred in connexion with it, I propose to inquire into the causes that gave rise to them. The matter may be divided into two heads. (1) The surgeon failing to find a stone when there is one. (2) The surgeon operating for stone when there is none. The former mistake has happened more frequently than the latter. There is probably no surgeon of much experience who could say that he had never missed a stone; and in Mr. Coulson's classical work "On Diseases of the Bladder" there are numerous instances recorded of the non-detection of a calculus. When we consider that on several occasions stones as large as mandarins escaped the search of Civiale, the greatest lithotritist, probably, that the world has ever seen, and were grasped by Mercier's hands, we can hardly wonder at the mistakes which have occurred. I know that I have failed to detect a calculus, whilst, on the other hand, I have discovered stones which had slipped through the hands of other surgeons. It may, indeed, be said that not only will one surgeon on a given day find a calculus which had not been discovered by another, but that he will in a given case find the stone one day and fail to discover it the next. The fact that calculi from time to time escape detection is due to two causes. (1) The employment of imperfect instruments for sounding. (2) The stone being encysted or covered by a prostatic valve or lobe. Various instruments have been devised for finding a calculus, but for the present the surgeon relies on the sound. Not so many years ago the sounds employed in this country were ill-adapted for the intended purpose, but recently more appropriately-shaped ones have been used. It can readily be imagined that small stones are sometimes very difficult to detect, but it is not so easy to account for the non-detection of large stones, and that, too, by surgeons of great experience. What is the reason that a stone escapes discovery sometimes, even when sought for by a skilful hand? It is simply *because only a part of the bladder was examined*, so that it may be said that the stone is missed simply because the place where it is lying is not searched. If a stone be present and be not encysted or covered by a prostatic valve or lobe, it will be discovered if properly looked for; but this implies an examination of every part of the bladder, or, in other words, the employment of an instrument which can search every nook and cranny, and as the sounds in use cannot, as a rule, accomplish that, a stone often escapes detection. When a patient suffers from calculus the bladder is usually irritable, and holds but little urine, and if the surgeon try to remedy the defect by an injection he will in all probability be disappointed at seeing the water escape either before or during examination. Hence, therefore, the cavity in which the search is to take place is of very limited dimensions, and will not permit the movement of a large beaked sound in it. It may be laid down that the shorter the beak of

the instrument the greater the range and freedom of movement that will be permitted to it. The burly captain of a small yacht may be scarcely able to move about in the contracted cabin, whilst his little son will run about with ease. Let me apply this to the case of sounding. A large-beaked sound may, through its great size, fail to detect a stone which could at once be discovered by a small beaked one.

Not many years ago the sound,\* Fig. 1, was in use, and may possibly be still employed by a few. Such an instrument would, in the long run, miss as many or more stones than it could find, for it



from all other sounds, from which it differs as much as one instrument can possibly differ from another. The beak is only five-eighths of an inch long, and is fixed to the shaft at an angle of  $110^\circ$ . It may be laid down that the nearer the angle formed by the beak and shaft approaches a right angle, the more fitted the sound will be to carry out the indications required. The worst sound is one which is nearly straight, and the best one is that which has a right angle; but inasmuch as a sound with a right angle could not be introduced into the bladder, Mercier has fixed the beak of his sound to the shaft at an angle which nearly ap-



could only be capable of very limited movement, as it could not be rotated, and its progress would be arrested by the folds or fasciculi of the bladder. More recently the sound, Fig. 2, has been used considerably, and is a great improvement on the former, as its beak is so much shorter, and allows the sound to range over an extent of ground denied to the other. So far as I know, it is one largely employed by the profession. Fig. 3 represents a well-known sound; it is hollow, and is superior to the two already mentioned, but its eye ( $\kappa$ ) is in the wrong place, for it is in the convexity of the instrument, where there is the greatest friction. Situated as it is it is calculated to annoy the patient, or to become plugged with mucus. The eye of every sound ought to be made in the concavity (see  $\lambda$  and  $\mu$  in Figs. 5 and 6), as it is then sheltered, does not worry the patient, and is not likely to become blocked up with blood or mucus. At all events the instrument is superior to its predecessors. The sound figured 4 is a still better one, as its beak is shorter; it is one that I formerly much used, and can speak well of.

I now come to Mercier's "coudée" sound (see Fig. 5). It has an individuality about it that is not possessed by any other sound, and it stands apart

from all other sounds, from which it differs as much as one instrument can possibly differ from another. The beak is only five-eighths of an inch long, and is fixed to the shaft at an angle of  $110^\circ$ . It may be laid down that the nearer the angle formed by the beak and shaft approaches a right angle, the more fitted the sound will be to carry out the indications required. The worst sound is one which is nearly straight, and the best one is that which has a right angle; but inasmuch as a sound with a right angle could not be introduced into the bladder, Mercier has fixed the beak of his sound to the shaft at an angle which nearly ap-

proaches it. He has at the same time greatly shortened the beak, so that of all sounds extant this one permits the greatest amount of movement in the bladder. The relative merits of sounds can easily be ascertained by employing them on the same patient. For instance, if Mercier's sound be used after another one, the patient will say that it annoys him less, and the surgeon will find that he will be able to reverse its beak, and to rotate it in all directions without hurting the patient, for the movements of the short beak will not be arrested by the fasciculi of the bladder; the escape of a drop of blood will be an event of very rare occurrence. If, on the other hand, a sound with a long beak be employed it will hurt the patient, bring blood perhaps, and its movements be arrested by the fasciculi. It is of the greatest moment to be able to rotate the sound freely in all directions, especially in the region of the neck of the bladder, and experience will teach that the short-beaked sound of Mercier is the only one by which a proper examination of the neck of the bladder can be carried out. All sounds ought to have the tips of their beaks well rounded and made very blunt, so that if the third lobe of the prostate be enlarged they will not press into it when passing into the bladder. If a sound be tapered or olive-tipped, it will hurt the patient and bring blood. To those not accustomed to use a "coudée" sound, it may

\* The sounds represented in the woodcut are drawn of their actual size. They appear large, however, because only the beaks and parts of the shafts are delineated.

seem difficult to pass, but it is not so, and the surgeon will rarely fail to introduce it; whilst, on the other hand, he will succeed in passing it when unable to get in other sounds.\* It requires to be introduced much in the same way as a lithotrite, taking care that the act of depressing the handle be delayed in order to allow the sound to proceed as far as it can whilst in the vertical position. It may be laid down that all sounds ought to be made with slender shafts, for the movements of a sound with a thick shaft in the urethra are very irritating to the part, and annoying to the patient. The evil may be reduced to a minimum by having the shaft made not larger than a No. 6, English size.

The advantages of Mercier's sound over all others may be thus summed up. 1. It avoids false passages, as it presents to them, not its point, as other sounds do, but the heel of its beak. 2. It can be introduced when the surgeon has failed with other sounds. In certain cases of enlargement of the third lobe of the prostate ordinary sounds cannot be passed, whilst Mercier's sound will rarely fail. 3. It annoys the patient less, as it does not rub sharply against the fasciculi. 4. It can be made to examine a larger surface of the bladder than any other sound, as its short beak permits it a greater freedom of movement. 5. It is the only instrument which can diagnose accurately the existence of tumours of the bladder, prostatic valves, &c.

Recently M. Mercier has made a modification of his sound to be employed in cases where the presence of a small stone is suspected, but not detected. If a section be made of the beak of any sound, it will be found to be convex (see Fig. 9, *v*), so that it strikes a stone (*s*) with its convex side; and, as the surface of all stones is usually convex, it follows that the two bodies are brought into contact at points only (see Fig. 9), and as a result, not only is the sound so faint that it may be lost by transmission, but the convex beak of the sound tends to slip on one side or other of the stone, or to push it away. Now Mercier has flattened the beak of his sound, and then excavated each side, so as to make a considerable hollow, into which the eye opens (see Fig. 7).† In this way a larger surface of the sound and stone is brought into contact, so that instead of the two bodies being only brought into apposition at a point (as seen at Fig. 9), they touch at several points (see Fig. 10), and it follows that the sound produced by the collision is proportionately increased in intensity. Thus, therefore, the small stone which was perhaps silent when struck with a convex beak will give forth a decided sound when hit with a sound whose beak presented a concave surface to it.

One of the causes of the non-detection of small calculi is, I think, to be found in the fact that, as a rule, they lie close to the neck of the bladder; so that when the sound is introduced it passes by the stone and makes for the fundus, and as the surgeon felt nothing on entering the bladder, he concluded there was nothing at that spot. I have usually found small calculi at the left side of the neck of the bladder. Mr. Coulson has a "lex non scripta" to the effect—"Behind an enlarged pros-

tate suspect a stone." The experience of every surgeon would, I think, go to prove that most adults who have suffered from stone have also had enlarged prostates. When a small stone is lying quietly behind an enlarged gland it can be readily imagined how easy it is to miss it, especially with the sounds usually employed in this country, and hence it is always well to raise the patient's buttocks on a good stiff bolster, so as to make the fundus the lowest portion and force a stone to roll into it from the neck. The introduction of the left forefinger into the rectum to tilt up the bladder, the depression of the hypogastric region with the left hand, and the withdrawal of the urine through the sound, are valuable and indispensable aids when searching for stone.

I now come to the second portion of my subject—operating for stone when none exists. This accident has occurred more frequently than may perhaps be suspected, and has arisen this way:\*. No physician can diagnose whether a given sound heard in the heart be abnormal or normal, unless he know what are the sounds that can be heard in the normal state. Neither can a surgeon interpret what he may hear in the bladder unless he be acquainted with the sounds that can be evoked from a healthy organ. Now I have found, by examining dead bodies, that usually three bony points can be made to give forth sounds—i.e., the sacrum (see Fig. 8, *N*), the spine of the left ischium (*P*), and the spine of the right ischium (*O*). These bony points can usually be struck, but not always, and they emit dull sounds which may be mistaken as proceeding from calculi. I imagine they have misled surgeons in this manner. When the surgeon has passed a sound into the bladder, struck something, and heard a something, he concluded that as the sound was given forth in the bladder it must have proceeded from a foreign body in that viscous. The fact was, that the thing struck was *outside the bladder and not in it*. The sound did not originate in the bladder, but was transmitted through its walls. Then again the shaking of the links in the surgeon's cuff may deceive. I have, on more occasions than one, when sounding for stone, heard a bystander say, "There is a stone, I hear it." I have then taken out my links and asked him if he still heard the sound, and he has replied, "No." Even the click produced by shaking a well-oiled sound in the urethra may mislead. The hypertrophied fasciculi of the bladder may be covered with a phosphatic deposit, and transmit a sensation of there being a something in the bladder; or the third lobe of the prostate may be enlarged, pedunculated, covered with earthy matter, and when struck give forth a sound. Lastly, a fungus, a tumour, blood-clot, or hydatids must be added to the list of things capable of leading a surgeon astray.

Now one means of clearing up any doubt as to what a certain sound may proceed from is to make the patient change his position. Bony points will still maintain their relative situations, but a stone usually rolls about. But if a surgeon use a lithotrite before operating—and no surgeon ought to operate without first of all examining the bladder of an adult with that instrument—mistakes will be rendered almost impossible. A lithotrite will not

\* Occasionally, but very rarely, a case will occur where no sound of any shape can be passed. I will, in another communication, give the solution of the paradox, "How to introduce a sound where none can be passed."

† The beak has been represented rather too large, and set at an angle too near 90°. As the beak is flat and thin, it does not precede the beaks of other sounds in circumference.

\* The great Cheselden cut three patients without finding any stone, and Mr. Gutteridge, who is probably the most successful lithotomist in this country, states that he has on three occasions done likewise.

clutch the sacrum, or any other bony point, but it will burst blood-clots and hydatids, and enable the surgeon to say whether a given body in its jaws be a stone or only a pedunculated tumour.

ON A CASE OF

DOUBLE FEMORAL ANEURISM TREATED  
WITH SUCCESS BY RAPID COM-  
PRESSION:

RETURN OF ONE ANEURISM; LIGATURE OF THE  
EXTERNAL ILIAC UNSUCCESSFUL; CURE  
BY LAYING OPEN THE SAC.

By THOMAS ANNANDALE, F.R.S.E.,

Surgeon to the Edinburgh Infirmary, and Lecturer on  
Clinical Surgery.

MR. EDWIN MALING, of Sunderland, has very kindly sent me the following notes of this case while under his care in the Sunderland Infirmary, where the first treatment was successfully carried out.

A. M—, aged thirty-seven, boiler-maker, was admitted into the Sunderland Infirmary in May, 1873, on account of an aneurism of the left femoral artery, situated immediately below Poupart's ligament. The patient attributed the disease to a fall against an iron bolt about two months previously. After being kept in bed for two weeks, digital and instrumental pressure was, on the 21st, applied to the corresponding external iliac artery for five hours, but without success, owing to the restlessness of the patient. On the 29th continuous digital pressure was applied for seven hours and a half on the same vessel, with the result of curing the aneurism.

On September, 1874, the patient was again admitted into the Sunderland Infirmary, suffering from an aneurism of the right femoral artery, which had resulted from a blow by a piece of metal. He was confined to bed for about ten days, and on Oct. 3rd, continuous pressure, partly digital, partly instrumental, was applied over the external iliac artery for eight and a half hours, during the last three of which he was kept under the influence of chloroform. This treatment was followed by a permanent cure of the aneurism.

On the 15th of March, 1875, he was again admitted into the Sunderland Infirmary, suffering from another aneurism in the left groin. This aneurism was considered to be one of the profunda artery, and its pulsation was not controlled by pressure made on the external iliac. An operation for the relief of the disease was suggested to the patient, but he declined to submit to it, and after two months' treatment by the administration of iodide of potassium he left the infirmary with the aneurism still uncured.

Having friends in Scotland, he found his way to Edinburgh, and on the 9th of June, 1875, he placed himself under my care in the Royal Infirmary.

When examined after his admission there was found in the left groin a pulsating swelling, elongated in shape and a little larger than a hen's egg. The tumour was situated immediately below Poupart's ligament, and passed deeply into this

part of the thigh, more so than is usual in a femoral aneurism in this situation. All the characteristic symptoms of an aneurism were present, and although pressure over the region of the external iliac artery diminished the pulsation in the tumour, it did not completely stay it. The external iliac artery on this side was not in its normal position, but had taken a curve downwards into the pelvis. Pulsation in the tibial arteries at the ankle was distinct, but somewhat feeble. The right femoral artery was apparently obliterated for about six inches below Poupart's ligament, and no trace of aneurism could be detected in this vessel.

As satisfactory compression could not be adopted in the present instance, the case seemed a proper one for ligature of the external iliac artery. Accordingly, on June 23rd, I secured this vessel at a point corresponding to the middle of its course. The artery was tied with prepared catgut, and the usual antiseptic precautions were employed during the operation and in the after-treatment of the wound. The immediate effect of the ligature was an almost complete cessation of the pulsation, with a diminution in the size of the tumour; but a feeble pulsation still remained in the aneurism. The patient's progress after the operation was excellent, and all the stitches were removed on July 2nd. The aneurism was now small and much firmer to the touch, but pulsation was still present, and was, if anything, slightly increasing. On July 11th direct pressure was made on the tumour by means of an india-rubber ball filled with small shot, and this pressure was continued for a few hours daily for some days, but without much good result. At this time it was found that pressure over certain parts on the inner and lower aspects of the tumour diminished very much the pulsation in the aneurism, and therefore it appeared evident that the profunda and anastomosing branches connected with it had some communication with the sac, and accounted for the non-success of our treatment. Pressure on the abdominal aorta, with and without chloroform, was next tried, and continued for several days for periods varying from half an hour to two hours and a half; but this treatment, although it slightly relieved the symptoms, made no permanent impression on the aneurism.

At this stage of the case the patient asked for a holiday, and he left the hospital on December 2nd, promising to return again in a few weeks. In the beginning of January of this year the patient returned and was readmitted into my wards. An examination at this time determined that the tumour had much increased in size, was more prominent, and had become much softer at one point. The pulsation had also increased, and the patient complained of constant and severe pain down the affected limb; he therefore begged me to do something for his immediate relief.

Having carefully considered all the circumstances of the case, I decided that the treatment most likely to cure the aneurism was to lay open the sac and secure the vessel or vessels at the point of their communication with it, and on January 11th I performed this operation, with the kind assistance of Professor Lister and Messrs. Bell and Chiens. The patient having been thoroughly chloroformed, the affected limb was held up for some minutes, so as to allow the blood to drain out of it; a common tourniquet was then applied, without a pad, tightly round the limb, immediately below the aneurism,

with a view of controlling the distal hemorrhage when the sac was opened. The abdominal aorta having then been compressed with Lister's tourniquet, I passed my knife into the centre of the aneurism, and followed it with my finger into the sac, so as to stay any bleeding which might not be controlled by the tourniquet. As, however, there was only a slight oozing from the interior of the sac, I withdrew my finger and laid the sac freely open by prolonging my incision upwards and downwards in the longitudinal direction of the thigh. When some portions of firm clot were cleared away, four openings were found to communicate with the interior of the sac, and from all of these there was slight arterial oozing. The situation of these openings was as follows:—One was at the lower end of the sac and corresponded with the distal end of the femoral artery; one was behind and to the inner side, and corresponded with the position of the profunda; one was on the inner and upper side, and corresponded apparently with the internal circumflex; and the fourth was on the outer side, and corresponded to the external circumflex. Owing to the oozing from the various openings, which was uncontrolled by the tourniquets, it would have been difficult to accurately secure these openings, had I not availed myself of a suggestion of Mr. Lister's, which was to pass into the openings metal bougies large enough to plug them, and at the same time they formed an excellent guide in dissecting round the opening so as to pass a ligature and secure the artery connected with it. In this way all the four arteries were securely tied, at their points of communication with the sac, with prepared catgut, and without injury to any important vein. After the ligature of these vessels the tourniquets were removed, and it was found that all hæmorrhage had been stayed. The edges of the wound were brought together with sutures, and antiseptic dressing was applied. The whole operation was performed under the spray and with the usual antiseptic precautions.

The patient's progress for some time after the operation was most satisfactory; the pain disappeared, and the temperature of the limb remained good. On the 22nd the edges of the wound separated, and its surface had an unhealthy appearance; his temperature also rose, and his condition gave rise to some little anxiety. On the following day hæmorrhage, to the extent of eight or nine ounces, took place from the wound, but was at once stayed by removing the dressing and exposing the parts to the air. The wound was apparently superficial, and therefore the antiseptic dressing was discontinued and boracic lotion substituted for it. No return of the bleeding took place, and his general symptoms improved, so that the report on the 1st February was that he was again quite well and the wound a superficial and healthy granulating one. From this day his progress continued perfect, and the wound steadily contracted. On the 15th February he was out of bed for the first time since the operation, and on the 20th he was able to walk about the ward and corridors. He left the hospital on the 14th March, and there was then no trace of the aneurism, and the temperature and all the movements of the limb were good.

*Remarks.*—The first and successful treatment by rapid compression of this case is a point of great interest and importance, and is an additional proof of the soundness of the principle that the

employment of this form of compression is a simple and safe method of treating femoral aneurism, and one always to be tried, if possible, before more severe measures are adopted.

In regard to the second aneurism, which formed on the left femoral artery, I am inclined to think that it was a return of the first one cured by compression, but it is unnecessary here to discuss this question.

The most important part of this case undoubtedly is, that an aneurism of the femoral artery existed, and that ligature of the external iliac artery and pressure applied in various ways failed to cure it. The explanation of this failure to cure the disease was diagnosed before the operation to be some free communication between the sac and one or more enlarged anastomosing vessels; and the operation disclosed how active the circulation in the sac must have been through the large branches which communicated with it. A point of interest to be here noted is, that after the application of the two tourniquets arterial blood still oozed from the arteries where they opened into the sac; proving that there must have been a free anastomosis through the deep epigastric, internal mammary, lumbar, intercostal, and deep circumflex iliac vessels. The fact that the femoral artery on the opposite side was obliterated would also tend to increase the anastomosis.

My opinion is that the aneurism was one of the femoral artery, involving that portion of it which gives origin to the profunda and circumflex branches, and that (as is not very uncommon) the two circumflex branches were given off directly from the femoral, thus accounting for the four openings in the sac.

As the aneurism remained uncured, and was steadily increasing in size, notwithstanding the careful employment of the treatment which is usually successful in this disease, it was necessary to consider what means should now be tried for the relief of the patient. The patient had experienced so much treatment, and had become so disheartened, that it was important to adopt some method which would be certain. It appeared to me that only one of three proceedings was applicable in the case. The first was galvano-puncture, the second ligature of the common iliac artery, and the third to lay open the sac and secure the vessel or vessels at their point of communication with it. I decided against galvano-puncture because our present experience of it in such cases is small, and I do not think that surgeons are yet in a position to decide as to the safety and success of this method of treatment, although I believe that further knowledge of the best means of using electricity may make it a valuable aid in some cases of the disease.

I decided against ligature of the common iliac artery because I considered it to be attended with greater risks, and also to be less certain in curing the disease owing to the free anastomosis already referred to, than laying open the sac.

I operated by laying open the aneurism because the cure of the disease was certain if the vessel or vessels could be secured at their point of communication with the sac, and because my experience of the antiseptic ligature and treatment made me very confident that the risks of such an operation were not great if the antiseptic precautions were carefully carried out.

Edinburgh.

## VAGINAL URETHROCELE.

By M. GILLETTE,

Chirurgien des Hôpitaux de Paris, Ancien Procureur à la  
Faculté de Médecine.

IN the number of *THE LANCET* for January, 1876, Mr. Lawson Tait published, under the head of "Saccular Dilatation of the Urethra; removal; cure," a very interesting observation beginning with "Mrs. B—, mother of a large family, had suffered for many years from a protrusion about the size of an egg from the vulva, which," &c. In concluding, Mr. Tait remarked that no parallel case had been recorded. Permit me to observe that I read to the Société de Chirurgie of Paris in February, 1873, a very similar case, which was published in the *Union Médicale* in the same year, under the term of "urethrocele vaginale," and upon which I operated with success by a different method from that employed by Mr. Tait. I should feel obliged by the publication of the accompanying case, which may prove of interest to readers of *THE LANCET*.\*

Partial dilatation of the canal of the urethra in woman appears to me to be an affection which is far from being familiarly known to practitioners. As the classic authors do not make any reference to it, I have thought some interest might be felt in the records of a case of this kind which has recently fallen under my notice, and on which I have had to operate. The description of a disease can only be derived from a series of facts published and collected together. I believe also that great advantage is always gained by drawing the attention of surgeons to isolated cases which may subsequently contribute to elucidate the nature of an affection, the history of which has not as yet been even commenced by modern authors.

Madame D—, aged 31, living in the country, near Montereau, was recommended by one of my friends to consult me in the early part of February, 1873. She presented all the appearances of a healthy constitution. She was married, perfectly regular, and had had three children without any accident. About a year previous to seeing me, and two months after the last confinement, which had been followed by a rather free catarrhal discharge, she noticed some uneasiness in passing water, and a slight sensation of weight in the region of the vulva. At first she paid no attention to it, but as the latter sensation increased in intensity, and the burning caused by the passage of water became more and more painful, she at length consulted a physician, who limited his treatment to the administration of diuretics and to injections of lead lotion and spirit. Nevertheless, a new symptom arose to disturb the patient. After each act of micturition, especially if she were compelled to remain in the erect position or to walk for a considerable distance, she felt herself wetted by a sudden discharge of urine almost without her consciousness and in spite of her efforts to prevent it. A curious point was, however, that this involuntary micturition was not accompanied by the burning pain which attended the voluntary

discharge. Being much tormented with her condition, she consulted a second physician, who treated her for an incontinence of urine. No improvement took place, however, and, though naturally buoyant in spirits, she became so demoralised that she almost entirely lost her appetite both for food and drink. Always in fear that she would wet herself, she deprived herself of all liquids. The urine escaped even during sexual intercourse.

On examination, I found that the finger introduced into the vagina felt immediately on the upper wall of this passage an ovoid swelling (*bosscure*), which yielded to very slight pressure, the urine at once being discharged. Continuing the vaginal exploration, the internal generative organs were found to be perfectly healthy.

And now, suspecting that I had to deal with a case of *partial dilatation of the urethra*, I next day made another examination of the vagina with the aid of a bivalve speculum. I then found behind the urinary meatus a tumour projecting into the vagina, and formed almost entirely by the anterior column of this canal. This tumour presented on the surface some of the transverse folds of this column, was of an ovoid form—that is to say, with a longer antero-posterior diameter of four and a half centimetres, and a transverse diameter of three centimetres (one and a half by one inch). It was more prominent below and in front, and was a little prolonged posteriorly. Its color resembled that of the vaginal mucous membrane, and on being lifted with the finger seemed, so to speak, to be reduced, whilst the urine escaped by the meatus. Having allowed the patient to repose for a few moments, I passed the catheter, which confirmed me in the view that the patient was not suffering from a cystocele, but from an urethral dilatation. A female sound introduced gently into the meatus was arrested in a cavity, and I could readily distinguish the point of the instrument in it through the walls of the vagina. On pressing it onwards it entered the bladder, which presented no displacement. The diagnosis was then confirmed that the case was one of vaginal urethrocele. Having at this time no intention of undertaking a surgical operation, I must admit I found myself rather embarrassed as to the measures I should propose to be adopted, but I recommended her to wear a pessary, and especially the caoutchouc pessary, which entirely filled the vagina; but she was disinclined to use it, and preferred to submit to some operation, however hazardous this might be.

In his "*Médecine Opératoire*" (tom. iv., p. 726), Velpeau, speaking of the abnormal dilatation of the urethra, remarks that in a patient affected with incontinence of urine, and in whom the urethra presented a considerable dilatation, M. Hobart had, in a communication made to the *Revue Médicale* (tom. iv., p. 285, 1830), proposed to excise a part of the inferior wall, and bring the edges of the wound together by suture, by which means the vesico-urethral functions might be restored. The same author mentions also the case of a woman whose urethra was so much enlarged that she was no longer capable of retaining the urine, and in whom Gensoul restored the canal to its usual dimensions by excising a flap from its inferior wall and bringing the edges together by the twisted suture. Lastly, in one of the *Séances de Chirurgie* (April, 1857), M. Demarquay ex-

\* M. Gillette adds:—"Si je ne l'ai pas traduite en votre langue c'est que j'ai craint, comme nous disons nous autres Français de ne pas le faire en assez bon Anglais." M. Gillette need not, we are sure, have feared criticism on this point, but we have translated his case for him.—Ed. L.

hibited the urinary organs of a young man, aged twenty-two, on whom he had operated for a large ampullary dilatation of the urethra. All the above examples refer more or less to general dilatation of the canal, whilst my patient suffered only from partial dilatation. I therefore discarded the idea of interfering in any way by operation with the wall of the urethra itself. I was not then acquainted with the observations of Foucher, published in 1857, on "Partial Dilatation" (*Moniteur des Hôpitaux*, p. 758), but resting on the sanguinary operation of Jobert for cystocela, I resolved to remove a portion of the anterior wall of the vagina, and to unite the edges of the wound. The most convenient position of the patient was undoubtedly that for vesico-vaginal fistula—viz., on the elbows and knees; but it seemed to be uncertain whether the tumour would empty itself completely, and it was always repugnant to the feelings of the patient. I therefore proceeded as follows:—

The patient being placed on her back, the lateral walls of the vagina were separated by the valves of the speculum; a double incision was then made, implicating only the anterior wall of the vagina and avoiding the urethra. These two oblique incisions approximated behind and diverged in front, and included a triangular flap of mucous membrane, the anterior base of which was seated on the most projecting part of the tumour, and was one and a half centimetres in length. The dissection of this flap (which was somewhat difficult since the urethra had to be respected) was made from the base to the summit, and this portion of the mucous membrane being excised, the two lips of the wound were brought together by the continuous suture, which was not very easily accomplished. The subsequent proceedings were simple. An S shaped sound was kept in the bladder for a fortnight, as after the operation for vesico-vaginal fistula. At the expiration of five days the anterior suture was removed, and the others consecutively. The patient was directed to make no effort, but to use an injection daily.

At the expiration of a fortnight Madame D— rose from her bed with no further inconvenience from the bladder. The tumour which had so long troubled her did not reappear upon her assuming the erect posture. After two months the patient assured me that there had been no relapse, and that she considered herself permanently cured. It is uncertain of course whether this case will be permanently cured, or whether from unforeseen circumstances it may not return. No answer can be given until after the lapse of at least a year or two. At the same time there can be no doubt that this patient has been relieved of a very distressing malady.

A few days ago M. le Dr. Troncin, a former pupil of Jarjavay, told me he had observed at Beaulieu in 1867 a case of vaginal urethrocele, which had not been operated on, in a woman of thirty years of age. The finger placed upon the tumour here also distinctly perceived the beak of a male catheter introduced into the cavity, and pressure on its surface caused a flow of urine.

## CASES OF AURAL POLYPL

By G. P. FIELD, M.R.C.S.,

Aural Surgeon to St. Mary's Hospital.

CASE 1.—A girl, A. M—, aged twenty-six, was brought to me at the hospital with most extensive disease of the mastoid cells. She had had a polypus removed somewhere in the country, about a year previously; no after-treatment had been adopted, and the discharge was allowed to continue until the inflammation thus set up extended to the brain, and she nearly lost her life in consequence. A free incision over the mastoid process down to the bone considerably relieved her, and by careful treatment for six months, by astringent lotions &c., keeping the parts constantly clean, she entirely lost the discharge, and regained a very fair amount of hearing power. This case shows what mischief may result from neglecting proper treatment after the polypus has been removed.

CASE 2.—A lady was sent to consult me by Mr. Milson, in June, 1874. The right membrana tympani was perforated, and a small red polypus could easily be distinguished making its way through that structure. She had suffered from an offensive discharge from that ear for eight weeks, with slight pain and tinnitus aurium. The ear was syringed frequently with warm water, and afterwards a warm solution of carbolic acid and sulphate of zinc; five grains of each to one ounce was ordered to be poured into the ear, and allowed to remain for some time. The polypus was painted every morning with a solution of nitrate of silver, twenty grains to the ounce. After a very short time the discharge and the polypus disappeared, the membrane healed up, and the patient regained her hearing.

This case shows very well how smaller growths may be made to disappear by the constant application of caustics. Strong solution of sulphate of zinc answers very well in some of the softer kinds of polypus; or a combination of the two, as used in this case, is perhaps the best treatment.

CASE 3.—E. W—, aged forty-two, came to see me at the hospital with a large polypus completely blocking up the left external meatus. Says that she "has been deaf for three or four months, and has had slight noises in the head, but no pain. There is a great deal of very offensive discharge which comes away at times." The growth, which proved to be a very large one, I removed. Very slight hæmorrhage followed, and she was completely cured by using the sulphate of zinc and carbolic acid lotion, as in the last case.

CASE 4.—A. L—, aged sixteen, came to the hospital December 6th, with a large polypus in the right ear. It was easily removed, but left a large perforation in the membrana tympani. She attended regularly for two months. The discharge continued for some time. All kinds of lotion were used; the acetate of lead, two grains to the ounce, proved of most service. At length the discharge ceased, the perforation became much smaller, and she left the hospital hearing perfectly well.

CASE 5.—This was a young man sent to see me by Mr. Ransford. Much the same kind of polypus as in last case; a very large one. The hæmor-



rhage after the operation was severe, but was checked after a little time by syringing cold water gently into the ear. The perforation in the membrane healed up remarkably soon. In ten days' time he was quite well. The carbolic acid and sulphate of zinc lotion was used diligently in this case.

CASE 6.—J. M.—, aged thirty-two, a school teacher, came to the hospital with a large polypus in each ear. They were both successfully removed with Wilde's snare. A great quantity of discharge came away afterwards, which readily yielded to the frequent application of astringent lotions. She was going on very satisfactorily when she left the hospital.

I could give a great many instances of the same kind; but what I want especially to point out is, that a successful termination to these cases is not to be expected unless a careful treatment is adopted after the removal of the polypus. If the discharge is allowed to go on unchecked after the operation, the disease will in all probability shortly return. Polypi are frequently removed, and no steps are taken to get rid of the accumulated secretion in the tympanic cavity, and, therefore, in a short time another polypus is likely to spring up again. Thorough cleanliness is most essential. Hinton remarks: "Growths of this nature in the ear are extremely prone to recur, but the degree of obstinacy with which they resist treatment is very variable. In some rare cases they will come away spontaneously and leave a permanently healthy surface; in others they will disappear before treatment, and show no tendency to recur; in others their eradication is attended with the utmost difficulty. It has seemed to me that the accumulation of secretion behind the polypus or its root is one of the most frequent sources of difficulty in their treatment, especially in cases where the membrana tympani is perforated. The viscid matter poured out by the spongy mucous membrane of the tympanum tends to cling about its various cravices and maintain a perpetual irritation which sets every kind of caustic or healing application at defiance. Accordingly, a chief object to be aimed at in the management of polypi is the perfect cleansing of the deep-seated parts of the organ. This is not to be effected by syringing merely, however vigorous and long-continued. Water does not remove the tenacious matter, nor, probably, does the stream reach the whole secreting surface."

I have found, almost invariably, that aural polypi arise from the mucous membrane of the tympanum, and not from the walls of the external meatus; but they occasionally take their origin from the membrana tympani, and sometimes from the Eustachian tube. They are, as a rule, the result of long-standing otorrhoea, and the polypus makes its way out through a perforation in the membrana tympani. They vary considerably in structure, size, &c. According to Stendener, the polypi which occur most frequently in the ear are mucous, the firm fibromata are less common, and the gelatinous myxomata the rarest. All kinds of methods have been proposed for their removal. My predecessors at St. Mary's, Toynbee and Allen, each invented an instrument—the former the lever ring forceps, and the latter a slender three-bladed pair of forceps. Dr. Purves has also introduced an excellent instrument for cutting through the growth. I always use Wilde's snare, and prefer it to everything else that has been suggested.

The illustration shows the microscopical appearance of the most common kind of aural polypus.

I am indebted to my colleague, Dr. Shepherd, for the following notes:—"On section the growth showed the usual fibro-cellular structure of these polypi—round, oval, and stellate cells imbedded in a delicate reticulum of fibres. In some places the latter were almost absent; in others, and apparently in the neighborhood of a collection of blood-vessels, the stroma was more distinctly fibrillated. The bloodvessels themselves, as shown in transverse and longitudinal section, were pretty numerous."

Lower Seymour-street, W.

## ON THE TREATMENT OF SEVERE SPRAINS.

By SAMPOSON GANGEES, F.R.S. Edin.,

Surgeon to the Queen's Hospital, Birmingham.

"SEVERE sprains are often serious fractures, though no bone be broken, or only a bit may be chipped off; the ligaments and fasciæ are ruptured, blood being extravasated into the joints, into the sheaths of tendons, and for some distance not infrequently between the layers of muscles. The swelling is great, the pain intense. The orthodox treatment by leeches and fomentations is valueless, compared with circular compression and perfect immobilisation."

Personal experience only adds strength to this opinion, and yet the orthodox antiphlogistic treatment continues to find favor with authorities. To quote one of the most recent and distinguished: "As to severe sprains, at first, while the active state of effusion is present, antiphlogistic measures are necessary. Where it is grateful to the patient, the sedulous application of ice-bags is, I think, the best; but if this is not tolerated, leeches, followed by warm fomentations or evaporating lotions, or

\* On the Treatment of Fractures of the Limbs, by Sampson Gamgee (London, Churchill, 1877), p. 152-3.

irrigation with spirit and water, will best check the tendency to effusion. As soon as the patient can bear it, equable pressure by strapping and bandage or by splints, with perfect rest, should be adopted."\* Not only can the patient bear well-applied pressure from the first, however great the swelling and acute the pain, but it may be laid down as a general proposition, to which I have never seen an exception, that, in severe sprains, effusion is most surely checked, and, once it has occurred, its absorption is most rapidly promoted, while pain is most effectually relieved, by pressure and immobilisation. It is as true now as when Velpeau taught it, that "compression is the sovereign resolute in contusions with infiltration and swelling."<†

By way of illustration, I may briefly relate the progress of a case in which I was consulted by my friend and colleague Mr. John Clay. His patient, an elderly gentleman, had recently sprained his right ankle in going over a ploughed field. As he had a policy in one of the accidental insurance companies, its medical officer saw the case, and he advised an incision to give vent to matter, which he thought had formed in the centre of the swelling. In this advice he was sustained by a hospital surgeon, who was additionally called in on behalf of the company. Mr. Clay, dissenting, invited my attendance. I found the right ankle hot and exquisitely painful. It was so much swollen that its circumference over the heel exceeded that of the corresponding sound joint by nearly an inch and a half. The skin on the outer side of the ankle was especially hot, red, tense, and shining; palpation in this situation communicated a feeling of elasticity closely simulating, but not amounting to, fluctuation. With Mr. Clay's concurrence and assistance I enveloped the limb from the toes to the knee in fine cotton-wool, applied well-moulded pasteboard splints on each side, bandaged with methodically uniform compression, and starched the outside. A second consultation was held in the course of three days, when I found the patient very much easier. He had had a good night's rest and had been able to turn over in bed, and could bear the limb lifted and put down again without pain. On opening the apparatus in front I found the swelling had considerably decreased; the previously red skin was yellowish and shrivelled like the skin of a late russet apple, not looking, as at my first visit, like the red shining skin of a prime Blenheim. That shrivelled look is always a good sign. I pared the edges of the case, and readjusted with firm pressure. Three days later more shrinking was met by fresh paring, and still firmer bandaging. At a consultation held a fortnight after the first, the patient was perfectly easy. No one thought any more about puncturing in search of matter. The insurance company compromised the affair by paying down a substantial sum of money, and I replaced the pasteboard apparatus by strapping the joint with emplastrum elemt spread on leather, and a Churton's bandage applied with smooth firmness. When I last saw the patient with Mr. Clay, he was walking about his garden with a stick; the plaster had been very properly removed, and the swelling had subsided, the only

difficulty to locomotion being stiffness of the joint. I cracked the adhesions by using the requisite amount of well-applied force, and we concurred in advising free use of the joint. In a note which I received from my colleague seven weeks after our first consultation, he wrote: "Our patient is progressing very satisfactorily; he comes to business every day, walks about a good deal, and does not require surgical supervision."

The case is a typical illustration of the proposition that severe sprains require immediate compression and absolute immobilisation.

Broad-street, Birmingham.

#### NOTE ON THE TREATMENT OF TETANUS BY NERVE-STRETCHING.

By GEORGE W. CALLENDER, F.R.S.,

Surgeon to St. Bartholomew's Hospital.

Is a paper read before the Abernethian Society\*, Mr. Milner has advocated the treatment of tetanus by nerve-stretching, and in some observations on this operation upon nerve-trunk I have expressed my regret, in narrating a case of tetanus, that the peroneal nerve was not exposed and stretched. Since this was written no case of traumatic tetanus has come under my care, but had the opportunity been given me I should certainly have planned an operation such as I have indicated, supposing, of course, that the nature of the case permitted me to stretch a nerve-trunk between the site of injury and the nerve-centres. I am glad to hear that quite recently M. Verneuil has had under his care in La Pitte a case which he will, I hope, shortly publish. A man had suffered from a severe crush of the hand, and, following this, showed the symptoms of tetanus. M. Verneuil exposed the median nerve at the elbow, and the ulnar at the wrist, and proceeded to exercise traction on them. The patient recovered completely.

I hope that this note may lead to a further trial of this method of treatment. The operation is not a severe one. The nerve is exposed and is stretched, when freed from its surroundings, by traction with an ordinary vulsellum, from its central connexions. No harm is likely to be sustained as a consequence. There is now abundant evidence, in the cases reported by Billroth, Nussbaum, and myself, of the tolerance with which nerves submit to forcible stretching, so far as the after-performance of their functions is concerned. In view of the unsatisfactory results of the treatment of traumatic tetanus as at present conducted, there is full justification for the performance of the operation as, at least, a last resource, although I should myself advocate its trial, as in the case under the care of M. Verneuil, as soon as the signs of the disease are distinctly recognised.

\* St. Bartholomew's Hospital Reports, vol. xi., 1875, p. 287.

† Clin. Soc. Trans., vol. vii., 1874, p. 100.

\* A Treatise on Surgery, by T. Holmes. London, 1875, p.

257. † "Le résolutif par excellence dans les contusions avec infiltration et gonflement, c'est la compression."—Velpeau, Leçons Orales de Clinique Chirurgicale, Bruxelles, 1841, p. 428.

ON THE RESULTS OF THE CAUTERY IN  
THE TREATMENT OF THE PEDICLE  
IN OVARIOTOMY.

By THOMAS KEITH, F.R.C.S. Edin.

I HAVE now used the cautery fifty times (in 216 operations) in the division of the pedicle. The results are given in the accompanying table. These results show 92 per cent. of recoveries, and are

I hope soon to give all the cases in detail, so that each one interested in the matter may judge for himself as to the value of this way of dealing with the pedicle. The success of ovariectomy depends upon many circumstances, and I do not say that the low mortality is to be altogether ascribed to the use of the cautery, for I know too well that, after a series of better results than usual, we are apt to think that we are on the right track at last, and that all will now go well, whereas we soon find that we are only rolling, like Sisyphus, the

| No. | MEDICAL ATTENDANT.       | DATE.       | AGE. | ADHESIONS, &c.  | RESULT.   |
|-----|--------------------------|-------------|------|---|-----------|
| 1   | Dr. George Balfour       | 1870. April | 35   | Acute suppurating cyst. Extensive parietal adhesions. 30 lb.                              | Recovered |
| 2   | Dr. Ronald, Ayr          | May         | 61   | No adhesions. Semi-solid tumour. 39 lb.   | "         |
| 3   | Dr. Ferguson, Leslie     | June        | 27   | Parietal, omental, and intestinal adhesions. 12 lb. Ascites.                              | "         |
| 4   | Dr. Stewart, Newport     | June        | 47   | Parietal, omental, and intestinal adhesions. 10 lb. Ascites.                              | "         |
| 5   | Dr. Stephenson           | Oct.        | 23   | Very extensive and firm parietal and pelvic adhesions. 18 lb.                             | "         |
| 6   | Dr. Haig, Airth          | Dec.        | 23   | Adhesions universal and very firm. 80 lb.   | "         |
| 7   | Dr. Kirkwood, Largs      | 1872. May   | 48   | No adhesions. 7 lb.; 4 gallons ascitic fluid.   | "         |
| 8   | Dr. George, Keith        | June        | 31   | Fold of intestine. 2½ lb. Ascites.  | "         |
| 9   | Dr. Walker, Dollar       | June        | 57   | { Adhesions universal, in pelvis, to bladder and rectum. }<br>Tapped twenty times. 50 lb. | "         |
| 10  | Dr. Keiller              | July        | 17   | Extensive parietal adhesions. 51 lb.  | "         |
| 11  | Dr. Lothian, Glasgow     | July        | 20   | No adhesions. 20 lb.  | "         |
| 12  | Dr. Thomson, Inveresk    | July        | 40   | Suppurating cyst. Adhesions very extensive. 30 lb.  | "         |
| 13  | Mrs. Morgan, Liverpool   | Aug.        | 35   | Extensive parietal adhesions. 60 lb. Tapped fourteen times.                               | "         |
| 14  | Mr. Wolford, Sunderland  | Sept.       | 57   | Acute suppurating cyst. Adhesions universal. 25 lb.                                       | "         |
| 15  | Dr. Logie, Kirkwall      | Oct.        | 31   | Parietal and omental adhesions. 26 lb.  | "         |
| 16  | Dr. Hardie               | Oct.        | 40   | Omental adhesions. 67 lb.   | "         |
| 17  | Dr. Stewart, Hexham      | Nov.        | 21   | Very extensive parietal and omental adhesions. 27 lb.                                     | "         |
| 18  | Dr. Gordon               | Dec.        | 67   | Intestinal and mesenteric. Solid tumour of ovary. 6 lb. Ascites.                          | "         |
| 19  | Dr. Campbell, Montreal   | Dec.        | 20   | Acute suppurating cyst. 25 lb. Adhesions very general.                                    | "         |
| 20  | Dr. Black                | 1873. Jan.  | 53   | Acute suppurating cyst. 29 lb. Parietal, intestinal, and hepatic.                         | Died      |
| 21  | Dr. Simpson, Marykirk    | Feb.        | 29   | Very firm parietal and pelvic. 19 lb. Much dissection.                                    | Recovered |
| 22  | Dr. James Sidey          | Mch.        | 63   | General parietal adhesions.   | "         |
| 23  | Dr. Wallace, Parsonstown | April       | 20   | Omental and general parietal. 41 lb. Both ovaries removed.                                | "         |
| 24  | Miss B., Edinburgh       | April       | 24   | No adhesions. 14 lb.  | "         |
| 25  | Dr. M. Duncan            | May         | 45   | Extensive and firm parietal and omental adhesions. 16 lb.                                 | "         |
| 26  | Dr. Howden, Haddington   | Aug.        | 57   | Intestinal, mesenteric, and pelvic adhesions. 30 lb.                                      | "         |
| 27  | Dr. Kydd, Aylth          | Sept.       | 36   | { Acute suppurating cyst. 55 lb. Adhesions very firm and ex- }<br>tensive.                | "         |
| 28  | Dr. Muir, Moniaive       | Sept.       | 24   | Omental, parietal, and pelvic adhesions. 35 lb.   | "         |
| 29  | Dr. G. Keith             | Oct.        | 27   | Burst suppurating cyst. 30 lb. Adhesions universal.                                       | "         |
| 30  | Dr. Lyall, Leven         | Nov.        | 27   | Very firm and extensive parietal and omental adhesions. 27 lb.                            | "         |
| 31  | Dr. McCulloch, Dumfries  | Dec.        | 24   | Extensive omental and pelvic. Solid tumour of ovary. Ascites.                             | "         |
| 32  | Dr. Hoggan, Thornhill    | 1874. Jan.  | 23   | Adhesions universal; very firm in pelvis. 43 lb.  | Died      |
| 33  | Dr. Bernard, Londonderry | Feb.        | 26   | No adhesions. 20 lb.  | Recovered |
| 34  | Dr. Dickson, Falkland    | April       | 65   | General parietal adhesions. 43 lb.  | "         |
| 35  | Dr. Wilson               | April       | 36   | Extensive parietal, omental, and pelvic. 25 lb. Ascites.                                  | "         |
| 36  | Dr. M. Duncan            | May         | 36   | Semi-solid. No adhesions.   | "         |
| 37  | Dr. Menzies              | May         | 51   | Extensive omental and intestinal. Ascites.  | "         |
| 38  | Dr. McGillivray, Oban    | July        | 46   | General and firm parietal and pelvic adhesions. 38 lb.                                    | "         |
| 39  | Dr. Bernard, Londonderry | July        | 29   | Parietal and omental adhesions. 75 lb.  | "         |
| 40  | Dr. Filson, Portaferry   | Oct.        | 44   | Solid malignant tumour. Ascites. Cancer of peritoneum.                                    | Died      |
| 41  | Dr. Barkus, Gateshead    | Oct.        | 31   | No adhesions.   | Recovered |
| 42  | Dr. Ziegler              | Nov.        | 60   | No adhesions. 16 lb.  | "         |
| 43  | Dr. Dickson              | 1875. Jan.  | 34   | General parietal adhesions. 27 lb.  | "         |
| 44  | Dr. McFadyen, Alva       | Mch.        | 30   | No adhesions.   | "         |
| 45  | Dr. Barkus, Gateshead    | May         | 34   | Parietal adhesions. 34 lb.  | "         |
| 46  | Dr. Perry, Glasgow       | May         | 39   | No adhesions.   | "         |
| 47  | Dr. Greig, Dundee        | July        | 23   | General parietal and omental. 40 lb.  | "         |
| 48  | Dr. G. Keith             | Sept.       | 49   | { Slight parietal. 53 lb. Small pediculated uterine fibroid also }<br>removed.            | Died      |
| 49  | Dr. S. Moore, Glasgow    | 1876. Jan.  | 37   | Very firm parietal and omental adhesions. 68 lb.  | Recovered |
| 50  | Dr. Wedderburn, Forfar   | Jan.        | 13   | Slight omental adhesion. 17 lb. Dermoid cyst.   | "         |

the best that I have yet had. This is not a large mortality. That it ought to be lower I am certain; and, while admitting that it may in this instance be partly accidental, the numbers are sufficient to prove that the method of dividing the pedicle by the actual cautery, as introduced by the late Mr. Baker Brown, is a good method, and one which has had scant justice done to it since his death.

stone which will tumble down whether we will or not.

Edinburgh.

# A Mirror

OF

## HOSPITAL PRACTICE,

BRITISH AND FOREIGN.

### GUY'S HOSPITAL.

#### A SERIES OF FIVE CASES OF OVARIOTOMY.

(Under the care of Mr. BRYANT.)

THE following notes, which have been collected by Mr. R. Carrington, late resident obstetric assistant, comprise all the cases of ovariectomy performed by Mr. Bryant at Guy's during a little more than a year.

**CASE 1. Ovarian disease; tapping; peritonitis; suppuration of ovarian cyst; ovariectomy; recovery.**—E. P., a married woman, aged thirty-four, was admitted June 30th, 1874. She had been confined seventeen months previously, and had suckled her child for fourteen months. The catamenia had not appeared since her confinement, but her general health had been tolerably good. Four months before admission she noticed an increase in the size of her abdomen, and imagined she was again pregnant. She increased so rapidly, and suffered so much pain, that she called in medical assistance, and was tapped, and three gallons of fluid drawn off. Three months after this paracentesis was again performed, and a slightly larger quantity of fluid evacuated. She was then examined by Mr. Bryant, and came into the hospital with the wound of the last puncture unhealed.

On admission, it was quite clear that some peritonitis existed, and, judging from the constitutional symptoms, it seemed probable that disorganising changes were going on in the ovarian tumour. The pulse was 120; the temperature was several degrees beyond normal; and the abdomen was very tender.

Under these circumstances an immediate operation was proposed, and on July 18th it was performed. A long incision of about eight inches was made, and a quantity of ascitic fluid, opaque, and containing pus with flakes of lymph, evacuated. An ovarian tumour was exposed, with its surface covered with lymph, and firmly adherent to the left side of the abdominal parietes and pelvis. It was clearly polycystic. The tumour was tapped, and a quantity of fetid pus and broken-up tissue turned out. A free incision was made subsequently into the cyst, and its contents broken down. The cyst-wall was then carefully separated from its parietal and pelvic attachments, and the whole removed, this part of the operation being attended with some difficulty. The pedicle was found to be a thick one, but it was long enough to admit of the application of a clamp. This was consequently applied, and the abdominal cavity

carefully sponged. A few omental adhesions were divided and ligatured, and the wound closed by deep and superficial sutures.

After the operation everything went on well. The pulse and temperature at once fell, never to rise again above the normal standard. The clamp came off on the twelfth day, and on Sept. 12th the patient left the hospital convalescent.

This case must be regarded as a very instructive one, illustrating as it clearly does the propriety of removing an ovarian tumour, the seat of disorganising changes, even when suppurative peritonitis is present. All constitutional symptoms rapidly subsided after the operation.

**CASE 2. Ovarian disease; rupture of cyst; ovariectomy; enucleation of cyst; recovery.**—M. W., a married woman, aged forty-five, was admitted on April 27th, 1875. Her last child was born four years before, the delivery having been premature at seven months and a half. She had generally enjoyed good health, although for twelve years she had experienced a dull pain and some swelling at the lower part of her abdomen on the left side. The swelling increased very slowly, although for the eight or nine months before admission it had grown more rapidly. Three months before she was suddenly seized with acute pain at the lower part of the abdomen on the right side, and this pain lasted for twenty-four hours, and was attended with much constitutional disturbance. It then gradually subsided. For three months after this the abdominal tumour diminished in size; it then steadily increased, although the woman did not think that it ever regained its former size. She was in the hospital for ten days after the onset of the abdominal pain, under the care of Dr. Hicks, when rupture of the cyst was diagnosed.

On admission her abdomen was very large, and an ovarian cyst was felt, in which there did not appear to be much solid matter. The patient was examined on April 30th by Dr. Galabin, who reported that the abdominal tumour seemed well suited for removal, but that pelvic adhesions were probable.

May 5th.—Ovariectomy was performed by Mr. Bryant. The cyst was found to extend downwards between the layers of the broad ligament, the pedicle being obscured. By the aid of the scalpel the peritoneal covering of the cyst was divided and the cyst itself enucleated from its serous covering; a long pedicle was then brought into view, and this, together with the posterior layer of the broad ligament, was clamped and brought out through the wound, the edges of which were secured by silk sutures. The cyst was compound, containing but little solid matter.

On May 11th the sutures were removed; on the 17th the clamp came away, and on the 24th the patient went out, having made an uninterrupted recovery.

This case is of interest, as showing the practicability and value of enucleation, as without this mode of procedure it would have been impossible to have brought it to a successful termination; and this remark is probably applicable to a large number of cases.

**CASE 3. Polycystic ovarian tumour; ovariectomy; recovery.**—R. O., a married woman, aged fifty-six, was admitted March 26th, 1875, having been sent by Dr. Carey, of Guernsey, to

Mr. Bryant. Nine years before her right breast was removed, but she was told it was not for cancer. Menses had ceased four years. The previous summer the abdomen began to enlarge, and this was followed by swelling of the legs. She did not notice any definite lump on the abdomen. Her abdomen measured thirty-eight inches in circumference, was spherical in form, tense and elastic, dull on percussion in front, resonant on the flanks, and there was the thrill of fluid. The os uteri was high up, and the cyst could be felt in front of it, and pressure on the abdomen was communicated to the finger in the vagina. Dr. Hicks examined the patient and gave the following opinion:—"Ovarian cyst, mainly simple; uterus apparently small and drawn up high; some solid tumour felt below, but all the tumour is above the brim."

April 10th.—Mr. Bryant performed ovariectomy. The cyst, which contained a large quantity of clear yellow fluid, easily emerged, there being no adhesions. The pedicle, which was rather fleshy, was clamped and secured externally, and the edges of incision brought together by superficial and deep sutures. There was but one large cyst, with the diseased ovary, which was cystic, and of the size of an orange.

The clamp came away on the fifteenth day, and the patient made a good recovery. The temperature only went as high as 100° on two occasions. On May 1st the patient went out with the abdominal wound all but healed.

**CASE 4.—Ovarian disease; puncture; ovariectomy; cure.**—T. H.—, aged twenty-four, married eighteen months, admitted October 6th, 1875. She menstruated regularly. Fifteen months before she was said to have had "sciatica." Three days after the commencement of this she noticed a swelling on the right side of the abdomen, unaccompanied by pain; this gradually increased in size. She was tapped three weeks before admission, and about a pint and a half of very thick, dark fluid was drawn off. The puncture kept discharging a clear fluid for three or four days. After this she kept her bed, and had occasional sharp shooting pains at the lower part of her abdomen. On admission her abdomen was the size of that of a woman at the full term of pregnancy. A polycystic ovarian tumour was diagnosed.

On October 20th ovariectomy was performed; no adhesions existed; the pedicle was short but narrow; it was secured by a clamp. No single bad symptom followed the operation. The clamp came off on the tenth day, and she was discharged cured on November 18th, 1875.

**CASE 5.—Ovarian disease; ovariectomy; cure.** Mrs. M.—, aged twenty-six was admitted in March, 1875, having been sent over to be under Mr. Bryant's care by Dr. Carey, of Guernsey. The disease had been coming for about one year; the tumour was polycystic, and involved the left ovary. Ovariectomy was performed on March 17th. No adhesions complicated the case, and the pedicle was moderately long. It was secured by a clamp, and a steady convalescence ensued.

The clamp came away on the fifteenth day, and the patient was convalescent on the 21st.

## WEST BROMWICH HOSPITAL.

**FEMORAL ANEURISM; LIGATURE OF SUPERFICIAL FEMORAL ARTERY; RUPTURE; GANGRENE AND AMPUTATION; DEATH.**

(Under the care of Mr. H. L. BROWN.)

THOMAS G.—, aged twenty-seven, was admitted into the Hospital August 21st, 1875. He had been a foot soldier for six years, and had had syphilis. Three months before, when lifting a weight, he felt something give way on the lower and inner side of the left thigh, but did not take much notice of it at the time. Three weeks after he observed a swelling as large as an egg over the place where he felt the strain. From this time the swelling rapidly increased until the date of admission.

On admission he was thin and cachectic; the left knee was flexed, and a large, tense, pulsating tumour occupied the lower third of the inner side of the left thigh. It was extremely painful, pulsation was extensible and well marked, the bruit audible but not very distinct, there was slight oedema of leg, and no perceptible pulsation in the tibia. There was also an acute pain running down the front of the leg. He was placed in bed with a pillow under his knee, and ordered ten grains of iodide of potassium in decoction of chincona three times a day, which produced iodism after the fourth dose; the iodide was then lessened to two grains and a half, which he took throughout.

August 23rd.—The bruit was louder, better marked, more rasping, and best heard over Hunter's canal; skin over tumour very dusky; and, in spite of opiates, the pain increased, and the patient continued very irritable and restless. All pulsation in the tumour stopped by pressure on the femoral artery. Pressure on the femoral above the tumour was tried, but it was found impossible to continue it in consequence of the extreme restlessness of the patient. Ligature of the femoral was accordingly resolved upon.

25th.—As the swelling of the leg was increasing it was deemed advisable to preserve the circulation through the profunda, so the superficial femoral was tied in Scarpa's triangle. The operation was performed as in Lister's plan, antiseptically, carbolic spray (1 to 100) being kept going the whole time, a carbolised catgut ligature being used, and carbolised protective gauze and macintosh being carefully applied after the sutures were drawn together. All pulsation and bruit in the tumour had ceased, and the limb wrapped in cotton wool.

26th.—The man doing very well; free from pain. Morning: temperature 100·8°; pulse 100. Evening: temperature 102°; pulse 108.

27th.—Tumour rather less, no pulsation or bruit; patient very much improved in health, and free from pain. Morning: temperature 99°; pulse 92. Evening: temperature 101·4°; pulse 102.

28th.—Still doing well. Morning: temperature 99·2°; pulse 96. Evening: temperature 99·4°; pulse 84.

29th.—Dressing removed and changed under spray. The deep part of the wound had closed completely; the superficial part suppurating, but without smell. Early in the morning pulsation was visible through the dressing, also a slight bruit heard. The man free from pain, and the swelling of limb gone. Morning: temperature 99·2°; pulse 72. Evening: temperature 99·6°; pulse 84.

Sept. 1st.—Temperature normal.

4th.—Pulsation still continuing, and the bruit having increased to its original loudness, a conical leather bag, containing six pounds of small shot, was applied over the artery, below Poupart's ligament, which entirely stopped the circulation through the tumour. The patient now bore pressure very well, being free from pain; and being a very intelligent man, he was easily taught to apply it himself, which he did from two to four hours a day, half an hour at a time.

12th.—Tumour much less; bruit very faint; pulsation diminished and undulatory.

16th.—No bruit, and very little pulsation; pressure still continued.

24th.—Swelling still less; no bruit or pulsation; shot-bag discontinued. Temperature normal.

30th.—When using the bedpan at night he stretched his leg, and said he felt something give way; had intense pain in his leg and knee. Subcutaneous injection of morphia given, which gave relief.

Oct. 7th.—The last six days the swelling has been rapidly increasing; no bruit, but slight pulsation; deep fluctuation not well marked; oedema of leg and foot commenced and increased rapidly, but the foot was perfectly sensible to touch. The pain had been intense, and only kept under by large doses of sedative solution of opium and repeated subcutaneous injection of morphia. No rigors; temperature normal.—4 P.M.: Aspirator needle introduced, but no sign of pus.—5 P.M.: Swelling of foot increasing, but perfect sensation.—7 P.M.: Gangrene commenced in the foot; extending rapidly.—10 P.M.: Amputation of thigh performed in upper third with long external flap. The man gradually sank, and died next morning.

In this case there are points of much interest. The man was a well-built, clever man, and during most of the time he was in the army had acted as officer's servant. Although he had a venereal sore, it is uncertain whether it was a hard chancre, as there was no history of secondaries. He was lifting a very heavy iron plate on his left knee when the strain took place. The rapidity with which the aneurism increased is remarkable, as in about nine weeks it had grown from the size of an egg to that of a large cocoa-nut. On dissecting out the tumour after death, a moderate quantity of blood (clotted) was found between the muscles and in the cellular tissue of the limb, not extending below the knee. The sac, which was very thin, had ruptured about two inches above the patella, slightly to the inner side. Inside the sac was a lot of firm old clot, laminated, newer clot, and coagulated blood. There was no trace whatever of the ligature to be found by the most careful dissection, and the femoral artery was patent from the iliac into the sac. The profunda was patent and healthy; the femoral vein inflamed, and fibrine deposited at intervals on the internal coat. There was a well-marked depression and roughening on the femur, about an inch in length, where absorption had commenced from pressure. It was found that the catgut ligature had become absorbed before occlusion of the artery had taken place, and therefore the blood had again forced its way through into the sac. In Holmes's System, vol. v., p. 623, it is stated:—"Anyone desirous of convincing himself of the absorption of catgut has only to employ it for ligatures and treat antiseptically, and in a few days he will find the knots come off with a touch, the part of the stitch em-

bedded in the tissues having disappeared." In this case the division of internal and middle coats had not taken place, and any lymph which might have been effused was not sufficient to block up the artery during the time necessary for a firm plug to form, and any influence the ligature had on the outer coat was entirely effaced by the time the dissection was made. Although Lister's method was most carefully observed during the whole of the operation, there was suppuration, but of an inoffensive nature; and there was no blush or sign of erysipelas on the skin round the wound (the reverse being the case with most other wounds in the hospital at that time). The rapid cessation of pain and improvement in the health of the patient after ligature gave every hope of a fair recovery, the symptoms of obstructed circulation in the limb being lessened instead of increased. Although there was no rise in the temperature and no rigors, it was hoped that swelling coming on six weeks after ligature might be due to suppuration and not to rupture of the sac, so nothing was done until gangrene appeared, which was most rapid. The pulsation, which returned on the fifth day, was put down to active collateral circulation being established, and not to the giving way of the ligature. In spite of the advantages claimed for catgut (the last case in which Mr. Browne used it was one of ligature of the common carotid for aneurism of the external, with union by first intention, and not a single bad symptom to follow), Mr. Browne remarked that he certainly should not use it again, but should depend on the prepared silk. The very atheromatous condition of the artery was probably the cause of the non-division of the inner coats. A post-mortem was not permitted, so the state of the aorta and other arteries could not be ascertained.

## UNIVERSITY COLLEGE HOSPITAL.

### TWO CASES OF STONE IN THE BLADDER.

(Under the care of Mr. BERKELEY HILL.)

FOR the following notes we are indebted to Mr. A. P. Gould, surgical registrar.

*Stone in the prostatic urethra left for eighteen months after attempts at lithotripsy; median lithotomy; recovery.*—A patient aged sixty, was admitted into the hospital on March 12th, 1875, with a history of symptoms of stone in the bladder for fifteen years. Eighteen months before his admission he had been a patient in a cottage hospital, where the stone was discovered, and a lithotrite introduced with the intention of crushing it. During this operation the stone was seized and broken; but the instrument could not be withdrawn for some hours afterwards. Some pieces of stone were brought away at the time, but no more attempts were made to remove the remainder. After some weeks the patient left the cottage hospital, continuing to suffer from great pain and dribbling of urine. The urine had always been very thick, and for two months before admission to University College Hospital a little blood had been mixed with the urine. To allay the pain he had become a confirmed opium-eater, and swallowed from twenty to thirty grains daily. His weakness was extreme; appetite almost gone; he

was emaciated, highly nervous and irritable, and despondent of the possibility of any relief to his sufferings. The urine was highly ammoniacal and fetid, and contained nearly one-half albumen. A catheter passed along the urethra met no difficulty until the neck was reached, when it travelled over a stony mass, apparently of some length. The bladder was empty.

On the 17th March, 1875, the patient was cut by a median incision, and calcareous deposit removed partly from the urethra, but also partly from the bladder itself. This deposit consisted chiefly of large angular fragments of a uric acid stone and partly of new phosphatic concretions; the whole weighed 200 grains. The bladder was excessively contracted, but there was no difficulty in the extraction, and very little hæmorrhage from the wound. The patient made a very slow recovery, the wound in the perineum being not quite closed when he left the hospital on the 23rd April, though urine had for some time been entirely voided through the urethra. The cystitis had ceased, the urine was clear, slightly acid, and free from albumen. He could hold his water about two hours.

During 1875, and in February, 1876, the patient presented himself at the hospital on several occasions. At his last visit he was about and felt well, and went regularly to work. But he was frequently troubled with irritation of the bladder; when he could not retain his urine at all, and was compelled to wear a urinal. The urine at these times was thick and somewhat ropy. He had been repeatedly sounded; the bladder was of very small capacity, but no stone was detected. The prostate appeared normal. Zinc and quinine injections into the bladder quickly improved the condition of the urine, but were not found to prevent its relapse after a shorter or longer interval.

*Two uric acid stones, weighing together an ounce and a half, taken from a boy of fourteen by lateral lithotomy.*—E. B., a well-nourished, healthy lad, aged fourteen, was admitted into the hospital on April 26th, 1875. Seven years before he had difficulty in passing water. The family doctor was consulted, and he stated that there was "something the matter with the kidney, but that as the patient grew up he would get all right." He earned his living as a farm laborer. The difficulty of passing water remained thenceforth, and became greater and more severe during the eighteen months preceding admission. Three weeks before his admission the boy was sounded for the first time by a surgeon, who discovered a stone, and sent the boy to London for treatment. The patient declared that the pain, which was very severe, was always felt immediately after making water, and *was worse by night than by day*. Occasionally blood followed the flow of urine, and there was also sudden stoppage to the flow sometimes. There was a heavy feeling in the pubic region, and an aching in the left loin. Urine clear; specific gravity 1006; very slightly acid; no albumen.

The operation was the left lateral one. A large stone was found, and, owing to its size, was crushed before removal. A second smaller stone was removed afterwards entire. The stones together weighed an ounce and a half troy, or 720 grains; the smaller one only 145 grains; so that the large stone was nearly an ounce and a quarter in weight. The boy went on well after the opera-

tion; and, as he expressed it, "never had any more pain since he took the chloroform." The healing of the wound was delayed by two small fragments of calculus, which were passed on different occasions from the bladder. He was discharged in good health, passing his water wholly through the urethra five weeks after the operation.

Several facts of interest are contained in these cases. In the second case the fact that a child can carry a stone for many years, probably the whole seven that succeeded the first consultation of the doctor, in the bladder, allowing it to grow to over one ounce in weight, and meanwhile himself become strong and vigorous. Another point was the greater severity of the pain by night, a characteristic of enlarged prostate rather than of stone.

In the first case, of the patient who had been discharged uncured from the cottage hospital, the history of his treatment there was probably exaggerated by the patient. The permanent contraction of the bladder, with frequently recurring chronic cystitis, suggested the possibility of a fragment of stone being still lodged in some part of the bladder, or the presence of a sacculus or cyst in the wall of the viscus.

## ROYAL HOSPITAL FOR SICK CHILDREN, EDINBURGH.

CASE OF TRAUMATIC TETANUS, FOLLOWING INJURY  
OF THE KNEE; AMPUTATION THROUGH  
UPPER PART OF THIGH;  
RECOVERY.

(Under the care of Professor SPENCE.)

THE desirability of removing the peripheral source of irritation in traumatic tetanus was very clearly shown in the following case, for the notes of which we are indebted to Mr. J. Milne Chapman, M.B. It is, however, important not to overlook the admonition contained in the appended note by Professor Spence.

Wm. M., aged five, was admitted, under the care of Dr. Macdonald, on February 19th, 1876. A month prior to admission he fell from the back of a cart, and was drawn along the ground, receiving what was described as a deep wound over the inner aspect of the left knee. A stitch and simple dressing was all the treatment employed. From the first the inflammation spread superficially, and three weeks after the accident the knee began to swell. For some time before entering the hospital it was observed that his mouth was stiff, and that he could not swallow any solid food.

On admission, an ulcerated area about the size of the palm of the hand extended upwards from the level of the left knee-joint, with which it communicated at its lower part by an opening through which the inner condyle of the femur could be distinguished, exposed and roughened. The patient's general health was much impaired, but his appetite remained good. The temperature was 102° F. He was ordered a draught containing ten grains of chloral along with fifteen grains of bromide of potassium, but yet he passed a very restless night.

Feb. 20th.—Morning temperature 100°. In the afternoon, while retracting his tongue, his jaws



closed on it, and on its being freed the teeth snapped together. Temperature in the evening 105°. At eight p.m. he had an attack of opisthotonos, which lasted about two minutes. He was at once put under chloroform. Professor Spence, who was called in consultation, expressed the opinion that on account of the injuries alone, amputation was required. He accordingly, at 8.30, performed amputation through the middle third of the thigh by a long anterior and two shorter posterior flaps principally composed of skin. No sutures were used—merely three strips of plaster to retain the flaps in position, and the stump was covered with a single layer of lint soaked in carbolic oil. During the operation the child had two attacks of spasms, while under chloroform. The condyles of the femur were found to be split into the knee-joint, and the joint itself was filled with purulent fluid. Twenty grains of chloral were at once administered, but on coming out of chloroform he had attacks of opisthotonos every ten minutes for about two hours, when twenty grains more were given. The interval of rest then extended to forty-five minutes. After each spasm he had five grains of chloral, and on three occasions hypodermic injections of three, five, and seven and a half minims of solution of the sulphate of atropia (B.P.).

31st.—Slept soundly for about three hours in the morning. During the day he had four spasms, at intervals of about two hours. He took milk and chicken soup freely.—At 10 p.m., he had a very severe attack, which lasted for five minutes. Seven minims and a half of atropia were injected, and a spinal ice-bag applied.

He slept soundly, and had no more tetanic symptoms, except on one occasion, when Prof. Spence, observing a fixed expression on his face, ordered an atropine injection. His appetite continued good, and he was soon able to eat solids. The chloral was kept up, however, in diminishing doses for about a week. The temperature fell to 98.6° on the second day after the operation, and continued to range between 98° and 99° for nine days, when a considerable rise took place, coincident with the appearance of a measles rash. By the 14th of March, the face had lost all its pinched appearance, and the stump was almost entirely healed by primary union.

*Note by Professor Spence.*—In recording the foregoing case as a contribution to the treatment of a very obscure disease, I would not wish to be understood as indicating the opinion that amputation would be successful in arresting the tetanic symptoms in all cases where they arise from lesion of a limb, by removing the cause, and cutting off the continuity between the irritated peripheral nerves and the nerve-centres. Such an opinion would require much larger foundation than a single successful case.

I have frequently performed amputation of mangled fingers in tetanus, but without any benefit, although the operations were performed early in disease. Indeed, the progress of cases of traumatic tetanus would rather lead to the view that when the symptoms fairly manifest themselves certain changes have already occurred in the nerve-centres which the removal of the originating cause comes too late to benefit. But the case just recorded warrants me, I think, in saying that no remedial measures could have relieved the patient unless the injured limb had been removed; and, in

so far, the amputation must be regarded as a main part of the curative measures. In this case the disorganised state of the knee-joint left no room for hesitation; but, from my experience of tetanus, I believe the irritable and ulcerated cutaneous surface was the real exciting cause, and the result of this case would certainly encourage to amputate in similar cases, even where the local injury was less severe.

## WEST LONDON HOSPITAL.

INTERNAL URETHROTOMY; RETENTION OF THE CATHETER AFTER OPERATION, FOLLOWED BY ABSCESS AND FISTULA; ULTIMATE GOOD RESULT.

(Under the care of Mr. TEEVAN.)

In the following case the catheter was retained, not as a part of the operation, but for the purpose of setting up a discharge and breaking down some of the dense cicatricial tissue into which a portion of the urethra had been converted.

James G., a healthy-looking porter, aged thirty-seven, was admitted on Oct. 25th, 1875. The patient stated that seventeen years ago, whilst serving in the army at Malta, he contracted gonorrhoea and claps. One of the sores was situated at the meatus externus, and the urethra became swollen and indurated for several inches. Phimosis followed, and the foreskin was slit up. When he got well, an excavated scar was left at the urethral orifice. He did not suffer from constitutional syphilis, but he had a gleet on him for seven months. A year ago he was attacked with retention, which was only relieved by the hot bath, as the surgeon failed to pass any instrument. For the past three months he has only urinated in drops.

On examination, the penis was found large and indurated, and the urethra felt as if it contained a metal catheter. There was an excavated scar at the meatus externus, which was so contracted that it would only admit one of the finest filiform bougies. A second stricture could be felt at the root of the penis encircling the urethra like an iron band. Micturition could only be performed guttatum.

On October 30th, at 3 p.m., ether was administered by Mr. Alderton. As Mr. Teevan could not pass any director, he introduced a fine bougie, and enlarged the urethra for one inch with a tenotome. The second stricture was then examined, and found only to take a No. 1 English elastic catheter. A fine "bougie conductrice" was then passed, and the catheter staff screwed on to it and introduced into the bladder, the situation of the instrument being demonstrated by the escape of some urine. Both strictures were then divided in the roof from before backwards, and the urine withdrawn through a large metal catheter, which was immediately taken out. As there was so much dense cicatricial tissue, a No. 10 English elastic catheter was passed and retained *in situ* for the express purpose of setting up a discharge and breaking down the induration.

31st.—Mr. Alderton found the pulse 84 and temperature 100.2°; tongue furred. The patient had had a sleepless night.

Nov. 1st.—10 A.M.: Pulse 90; temperature 99°. No sleep last night. At 7.30 P.M. Mr. Teevan removed the catheter, as there was much tumefaction of the penis.

5th.—As the swelling of the penis had increased, and as there was much tenseness of the parts, Mr. Teevan made three incisions, each half an inch long, into the root of the organ. Bloody serum escaped freely. Temperature 100.4°; pulse 96. Patient had passed a good stream of urine through the meatus after the catheter was removed.

6th.—Some pus escaped from one of the incisions.

8th.—Urine observed to pass from one of the cuts.

10th.—Patient was in good heart and comfortable.

15th.—Up and about the ward. No. 15 French olivary catheter passed with ease into the bladder.

16th.—Patient in bed again, as he felt thirsty and feverish. Pulse 102; temperature 104°.

17th.—Penis and scrotum greatly swollen from an attack of erysipelas.

20th.—Erysipelas nearly gone. Pulse 78; temperature 98.4°. Pus escaped freely from incision.

27th.—Much better. Up and about ward. Taught to pass No. 10 French olivary catheter, and ordered to draw off his urine whenever he wanted to micturate.

From this date the patient gradually improved, and he left the hospital on Dec. 19th, able to pass a large stream of urine and to hold his water for eight hours, a small quantity of it escaping through the fistula. The patient attended as an out-patient twice a week to have a large instrument passed, the whole of the urine being always carefully drawn off by the patient. Success rewarded his perseverance, for by Jan. 31st, 1876, the fistula was quite healed.

Mr. Teevan observed that internal urethrotomy could boast of a splendid series of successes, such as no other operation for stricture could even approach. He knew that it had been performed by four different surgeons one thousand and thirteen times with but three deaths, one of which would probably not have occurred had it not been for the crowded state of the Hôpital Necker during the Commune. Hence, therefore, when a *contre-temps* such as he had described followed the operation, it was only due to urethrotomy to make it public and court inquiry. He knew that perineal abscess and fistula had occurred in a patient after the operation of so-called immediate dilatation, but the surgeon had not thought fit to publish the case. He had every reason to be highly gratified with his results after internal urethrotomy, never having had a death or accident, and he considered the abscess which had formed in the present instance had been caused entirely by the catheter which was left in the bladder. He no longer retained an instrument after any form of urethrotomy, as he felt convinced that it annoyed the urethra and retarded the patient's recovery. The present case added one more to the many adduced by Dr. Gouley, of New York, in favor of dispensing with the services of a catheter after urethrotomy.

## MIDDLESEX HOSPITAL.

FIBROID TUMOUR OF THE UTERUS, CAUSING DIFFICULT LABOUR, AND STILL-BIRTHS AT SEVEN MONTHS, IN FIVE SUCCESSIVE GESTATIONS; INDUCTION OF LABOUR AT THREE MONTHS IN THREE SUBSEQUENT PREGNANCIES.

(Under the care of Dr. HALL DAVIS.)

For the notes of the following case we are indebted to Mr. Mason, obstetric assistant.

Emma D—, aged thirty-nine, married, admitted into Prudhoe ward February 18th, 1876, and gave the following history:—She had a fall eight years ago, and injured the lower part of her back, and has been ailing ever since. She has four children living, one of them born four years ago, at seven months. Since the accident she has had five children at seven months, with difficulty, labour coming on spontaneously; none of these survived. Two labours have since been induced at three months. No inconvenience whatever is felt in the absence of pregnancy, and she goes about her work as usual; but when enceinte she has a sense of weight in the sacral region, and a bearing down when she walks. Has no difficulty in defecation and no dysuria. The catamenia have always been regular.

On admission a tumour was felt in the right iliac region, extending into the pubic region, nearly up to the umbilicus, and a little to the left of the linea alba, presenting to the taxis the character of a fibroid tumour, soft and elastic, without fluctuation. No pyrexia. Os uteri livid as in pregnancy, lips full. The uterus was in correct position, except that it was a little lower in the pelvis than normal. Some pain was elicited on pressing upwards against the cervix. She complained of a sense of weight in the sacral region, but no visible effect of the fall eight years ago was noticed externally, nor in the pelvic cavity. There was a bearing down when the patient walked. The tumour, felt abdominally, could not be detected per vaginam. No dysuria nor pain in defecation; bowels very costive. The patient was pregnant three months. The history of her five confinements at seven months, which terminated with difficulty in still-births, had indicated the necessity of inducing labour at three months in the last two pregnancies, and called for the same measure on the present occasion; the os uteri was accordingly dilated with sponge tents on February 19th.

Feb. 20th.—Slight bearing-down pains came on yesterday evening, and have increased in severity to-day. Pulse 100; temperature 98.8°. Bowels constipated. Simple enema.

21st.—Last evening about 10 o'clock the membranes ruptured, and a considerable quantity of liquor amnii escaped. Pains are becoming stronger and more frequent. Os uteri still only large enough to admit a medium-sized sponge tent.

22nd.—10 A.M.: Slept well until 6 o'clock this morning, when pains came on with increased severity, accompanied by constant retching. Pulse 120; temperature 105.2°. Tongue dry; face slightly flushed; os uteri dilated to about the size of a sixpence. Bowels constipated. Ice to suck.—12 o'clock, noon: Child born, accompanied by much hæmorrhage; skin of fetus desquamating. Twenty-five drops of liquid ex-

tract of ergot were given immediately, and repeated in half an hour; but the placenta, not being thrown off, was subsequently removed by means of ovum forceps guided by index finger. The placenta was adherent. Immediately afterwards, on injecting out cavity of uterus with warm Condy's Lotion, a second portion of placenta was washed out into vagina, and thence removed. For a short time previously patient had been delirious. Pulse 124; temperature 108.4°; retching continuing. Half an ounce of brandy, half an egg, and two ounces of jelly and beef-tea were injected into rectum every four hours. Linseed poultice to abdomen. Draught of effervescent citrate of potash every four hours.—6 P.M.: Pulse 116; temperature 99°. Not much hæmorrhage; some after-pains; no delirium; retching subsiding.

23rd.—12.30 A.M.: Patient retches occasionally; keeps down her beef-tea and medicine. Slight pains. Pulse 112; temperature 99°.—10 A.M.: Slept at intervals during night; not much discharge. No sickness. Has taken milk, also beef-tea and eggs; feels very weak and exhausted. Pulse 100, small and compressible; temperature 98.4°. Not much pain; tongue clean; some abdominal tenderness.

24th.—Pulse 84; temperature 98.2°. Had a good night; slight pains at intervals; very little discharge.

29th.—Improving since last date; is much stronger. Draught of quinine and iron thrice daily.

March 7th.—Discharged convalescent.

## CARDIFF INFIRMARY.

### EPITHELIOMA AT ANGLE OF LOWER JAW.

(Under the care of Dr. SHEEN.)

ALTHOUGH the patient in the subjoined case died within six years of the first appearance of epithelioma of the lip, the history shows the value of operative interference. If the patient had been more diligent, and had attended properly to the advice given him, his life might have been prolonged and the disease cured.

T. B—, aged sixty-two, was admitted August 10th, 1875, with a noded swelling, about the size of a hen's egg, at the angle of the jaw, on the left side, and which was slightly movable. It commenced as a small nodule about twelve months ago, but had rapidly increased in size during the six weeks prior to admission.

In July, 1871, Dr. Sheen removed an epithelioma of the lip from this patient; it returned eight months afterwards, and was again removed. After the first operation he was advised to show himself again if there should be the slightest return of the disease; but he disregarded this advice, and a large portion of the lip had to be removed at the second operation. The same advice was then given him, but he took no heed of it. There was no further mischief in the lip, and, indeed, the patient had scarcely any lower lip left. There was the scar of the incision, but it was quite soft, and free from pain and swelling. The patient's health was good, and he was very plucky.

On Aug. 18th, after a consultation, Dr. Sheen

proceeded to remove the tumour, under chloroform, by a triangular incision, the base of which was in a line with and above the ramus of the jaw. Only one vessel was tied. The tumour was dissected from above downwards, and was found to be closely adherent to the tissues surrounding and beneath it. It was torn from its lower attachments, the knife not being used in this stage of the operation, and just as the tumour was taken away there was a tremendous welling up of venous blood, apparently from the bottom of the deep large wound. Pressure with a small sponge stopped the hæmorrhage, but it recurred three or four times when the pressure was removed, and so quickly that no vessel could be seen. Dr. Sheen succeeded, however, in grasping between his finger and thumb a portion of tissue from where the blood appeared to issue, and the hæmorrhage at once ceased. This was held for a few minutes, and turned out on examination to be the anterior border of the sternomastoid. There was no further bleeding. Just before this, the patient was very restless, partly from loss of blood, and partly from semi-consciousness of pain. A hypodermic injection of one-sixth of a grain of morphia stopped this restlessness almost at once. (The good effect of this treatment was very noticeable.) After the removal of the tumour a large deep wound was left, at the bottom of which the carotid could be seen distinctly pulsating within its sheath. The stylohyoid and digastric muscles, with the hypoglossal nerve running across the space, were clearly shown as if after a minute and elaborate dissection. A square inch of the ramus of the jaw was bared of periosteum. The edges of the wound were brought together with hare-lip pins as well as the loss of skin would permit.

On the 31st he was up and felt "first-rate." The wound had filled up considerably and looked healthy. On October 5th he was made an out-patient. There was still an unhealed irregular surface of about an inch, with one or two suspicious-looking spots about it and some gluey discharge, but no pain. Bare bone at the bottom. Much contraction of surrounding skin. General health very good.

A few months later he passed successfully through a severe attack of erysipelas of the face whilst in the country, after which the disease increased rapidly, and he died in March, 1876, of exhaustion, about six years after the first appearance of disease in the lip.

A similar case to this occurred recently at Guy's Hospital, and was operated upon by Mr. Durlam. It is reported in the *Guy's Hospital Gazette* of November 6th, 1875.

## BIRMINGHAM AND MIDLAND EYE HOSPITAL.

### DOUBLE ACUTE GLAUCOMA.

(Under the care of Mr. LLOYD OWEN.)

FOR the notes of this case we are indebted to Mr. H. Eales, house-surgeon.

C. D—, aged sixty-three, a very nervous old woman, but healthy-looking and well-nourished, was admitted into the hospital on January 5th last, suffering from acute glaucoma in both eyes.

Tension =  $\pm$  8 in both eyes. Could see shadows faintly with right eye, and fingers faintly at ten inches with left eye. Her history was as follows:—For the past twelve months she had suffered occasionally at night from premonitory symptoms of glaucoma in left eye especially, going on sometimes to considerable haziness of vision. In the latter end of December last she was attacked with neuralgia all over the left side of the face, brought on, she thought, by worry and anxiety about family affairs. After this had lasted about a week she was attacked, on December 26th, about midday, with frontal headache, great pain in the eyes, vomiting, and depression of spirits, followed in an hour or two by failure of sight in the left eye, and four or five hours later in the right eye also. By the evening of the same day she could not see to go about the house. (She had not indulged in any excess of diet on Christmas-day, her meals being as usual.) She scarcely slept on the night of the 26th on account of pain, and on the morning of the 27th she found she was almost quite blind, and could only just perceive the light of a candle with either eye, and this light caused her great pain. She remained in this state for nine days, when she was first seen, and ordered two leeches to each temple, as she would not then consent to have any operation performed. The leeches did not bite on the right side, but those applied to the left side gave her ease and somewhat improved the vision of the left eye.

Two days later she came into the hospital for operation, when Mr. Owen on the same day performed iridectomy upwards in both eyes, making the incision through the sclera close to the cornea, and excising about one-third of the iris in each eye.

Within two hours after the operation she expressed herself relieved of pain, and the next day (Jan. 6th) she was quite free from pain, and could count fingers plainly at twelve inches. On Jan. 18th, eight days after the operation, she was discharged, all injection of the conjunctiva and sclera having disappeared, good union having taken place in the incisions, and her vision having improved daily.

On Feb. 3rd the following note was made:—Lens and vitreous humor quite clear in each eye. The optic disc looks quite normal in both eyes, with the exception of the faintest cupping of the left. Not the least trace of myopic choroidal crescent around either optic disc. Choroid and retina generally appear healthy in both eyes on ophthalmoscopic examination. Tension = about the normal,

perhaps slightly elevated. Vision =  $\frac{20}{70}$  Snellen,

with each eye, with a concave 1-80 spherical lens; presbyopia = 1-12. No apparent contraction of the field of vision in either eye.

### LONDON HOSPITAL.

SEPARATION OF EPIPHYSIS OF ANTERIOR INFERIOR SPINOUS PROCESS ON ILLUM BY MUSCULAR ACTION.

(Under the care of Mr. MAUNDER.)

For the following notes we are indebted to Mr. H. Habgood, house-surgeon.

William G—, aged eighteen, was admitted into the hospital on April the 5th. He stated that on the previous day, while running in a flat-race, he thought it necessary to "put on a spurt," and whilst doing so suddenly felt a sharp snap, followed by acute pain in the right groin, and accompanied by a sensation of "something being out of its place." He also found he could not advance his right foot another step, but being within a few feet of the winning-post he threw himself forwards, and grasping it, saved himself from falling. He then found it impossible to stand upright without great pain in the right groin, which was somewhat relieved by resuming the stooping posture. He was carried off the field by his companions.

On admission the patient was found to be a strong, healthy-looking lad, with well-formed limbs, and exhibiting no evidence of bone or other disease. There was no history of syphilis, strumous disease, or rickets; and he had ten brothers and sisters who were all healthy. He was observed to lie flat on his back with the thighs extended and the right foot slightly everted. He could rotate the right thigh inwards or outwards, but with slight pain. There was total inability to flex the thigh upon the pelvis, and the attempt to do so caused great pain in the groin. A little fulness was evident in the position of the spinous processes, and the inferior spinous process (the attachment of the straight tendon of the rectus femoris muscle) was found to be detached and freely movable. Cartilaginous crepitus was very distinctly felt, both by the patient and the surgeon. This, and taking into consideration the patient's age—eighteen (the epiphysis unites with the rest of the bone at about the age of twenty-five)—led to the conclusion that it was a case of separation of the epiphysis. The patient was simply kept in bed, the thigh flexed in order to relax the rectus femoris muscle, and a couple of pillows were placed under the knees.

April 21st.—All pain and crepitus on manipulation had disappeared, and patient could flex the thigh without discomfort.

April 25th.—Firm union had evidently taken place, and patient could walk about the wards with ease. Discharged.

The above case is very interesting on account of its extreme rarity.

### KING'S COLLEGE HOSPITAL.

SARCOMA OF THE PALATE; DYSPNOEA; CONTINUED DELIRIUM; LARYNGOTOMY; IMMEDIATE RELIEF.

(Under the care of Dr. GEO. JOHNSON.)

For the notes of the following interesting case we are indebted to Mr. Barrow, late surgical registrar.

Edward H. S—, aged fifty-four, a chimney-sweeper, who had been in the habit of drinking freely, was admitted on Jan. 26th, with delirium tremens. He soon became so unruly that it was necessary to remove him to a separate ward. A mixture of chloral and bromide of potassium was ordered, and in the course of a few days he became tolerably tranquil. It was, however, then noticed that he had a sarcomatous tumour involving the roof of the mouth, completely plugging

both nostrils, and extending very far back into the pharynx. The growth occasioned great dyspnoea, which seemed to be increasing. The difficulty in breathing was accompanied by loud snoring; and, although when awake the man breathed satisfactorily, when asleep the respiration became so difficult and noisy that every two or three minutes he started up in the bed gasping for breath. He now again became delirious, which state was only interrupted by periods in which he took this very disturbed sleep.

Dr. Johnson expressed the opinion that the delirium was now due to exhaustion from want of proper sleep, and suggested that laryngotomy should be performed, to enable the patient to breathe more freely. Accordingly, on Feb. 28th, Mr. Footner, the house-surgeon, performed the operation; and so pronounced was the effect that the man almost immediately fell into a sound, quiet sleep, from which he did not awake for twenty-four hours. When he awoke, the delirium had entirely subsided; and the general condition of the patient has since most markedly improved, notwithstanding the continued growth of the tumour.

### ST. THOMAS'S HOSPITAL.

#### CONGENITAL CLEFT PALATE TREATED BY THE APPLICATION OF STRONG NITRIC ACID, AND WITHOUT OPERATION.

(Under the care of Mr. FRANCIS MASON.)

Mr. MASON has at the present time under observation at this hospital several interesting cases of congenital cleft palate, which he is treating by the application of strong nitric acid alone, and consequently without the use of the knife. The ages of the patients vary from a few weeks to several years. Mr. Mason thinks that this method of effecting union is especially applicable to cases in which the cleft is of average extent, and even where the hard palate is partially implicated. In more severe instances the ordinary operation may be required. Mr. Mason finds that the application of the acid is attended with no pain or inconvenience whatever to the patient, and although the cure is more slowly accomplished, it has the advantage of being sure, and of completely closing the fissure in the most perfect manner, without the risk of the parts giving way, either wholly or partially, as too often happens after the usual operation of staphyloraphy. A further gain seems to be that the cases may be dealt with as out patients, as in all the examples now under notice. Mr. Mason, after many trials, prefers the strong nitric acid to any other form of caustic. We shall continue to watch the progress of these cases, and give the results on a future occasion.

## Editorial.

### THE DEVELOPMENT OF OVA AND THE OVARIES.

A VALUABLE contribution to our knowledge upon the formation of ova in the foetal ovary has been made recently by Dr. Foulis, in a paper published in the Transactions of the Royal Society of Edinburgh. The importance of the paper is considerably increased by the fact that it contains on one or two points rectifications of the statements of Waldeyer and others, which have hitherto been held to be correct. One of those statements concerns the nature of the ovary itself. Dr. Foulis conclusively proves that it has no right to be considered in any sense a tubular gland, and he shows clearly how the formation of the Graafian follicles takes place without any such process as Waldeyer imagined. In this place it will suffice to follow closely upon the descriptions of Dr. Foulis, whose observations were made upon the ovaries of the embryos of the cat, dog, rabbit, and man. About the earlier formation of these organs there is now no dispute. Embryologists are agreed that on the median side of the Wolffian body, the investing epithelium, continuous with the general epithelial lining of the pleuro-peritoneal cavity, becomes thickened; its cells here assume a columnar shape, they proliferate freely, and thus form a raised mass, of "germ-epithelium." From this layer the ova are subsequently developed, whilst the vascular stroma of the organ is formed by an outgrowth from the side of the Wolffian body. The activity of the processes of growth may be conceived by the fact that at birth the ovary contains no fewer than 85,000 ova. The production of these takes place as follows:—The germ-epithelial corpuscles, composed of nucleated masses of protoplasm more or less columnar in shape, rapidly proliferate. Then some of them become spherical, their nucleus swells up, assumes a definite lining membrane, and contains a well-marked nucleolus. Each such cell is a "primordial ovum," and in the human foetal ovary of seven months and a half there may be seen germ-epithelial corpuscles in all stages of development into these primordial ova. The nucleus of the cell becomes the germinal vesicle, and the nucleolus the germinal spot. Meanwhile the delicate spindle-celled stroma grows into the germ-epithelial layer, here and there separating several of these corpuscles, of which others are produced on the surface to make up for their loss. The groups of corpuscles thus isolated are destined to become groups and clusters of ova, for each of the germ-epithelial cells within the investment swells up and develops into a primordial ovum. But these egg-clusters do not long remain in this

**TREATMENT OF THE ITCH.**—*L'Union Médicale* gives, under the name of Wilhelm Petters (without further indications), the advice of using Peruvian balsam or styrax mixed with two parts of oil, in lieu of sulphur ointment. Very gentle frictions with the balsam or the styrax, without previous soaping, will destroy the acarus, as the balsam very easily penetrates into the furrows of the skin without the latter being torn. In this way the eczematous eruptions following the use of sulphur are avoided.

compacted condition; the stromal elements enter and isolate each primordial ovum just as the solitary primordial ova found in the germinal layer are isolated. The adhesion between the spindle-cells and the primordial ovum they invest is very intimate. The rapid proliferation of the germ-epithelial cells gives an irregularity to the surface of the young ovary so as to produce the appearance of depressions, or even of tubes; but Dr. Foulis is unable to trace the formation of any tubes of involved epithelium with which the egg-clusters are attached.

Each primordial ovum, with its thin investment of embryonic connective tissue, constitutes a Graafian follicle. Here, again, Dr. Foulis has thrown much light upon an obscure subject. The mode of formation of the Graafian follicle has been frequently described, and the most generally received explanation is, that the follicle, with its "membrana granulosa" and fluid contents, is derived, like the contained ovum, from the germ-epithelial layer—a view consistent with the tubular doctrine of the structure of the ovary. According to Dr. Foulis, however (who has never been able to see this tubular structure), the membrana granulosa of the follicle is formed by modifications of the spindle-cell connective tissue composing the vascular stroma; and he has been enabled to trace all stages in the process by which the cells arranged nearest to the ovum become so converted. As the ovum itself increases in size, the layers of corpuscles forming the membrana granulosa increase. Some of them remain surrounding the ovum; but a large number disintegrate, and contribute by their dissolution to form the fluid contents of the follicle; while, lastly, one layer remains lining the whole follicle. This layer has received the name of "follicular epithelium"—an appellation which cannot strictly be applied to it, since it is developed, not from pre-existing epithelial elements, but from connective-tissue cells. We have already seen how the ovum is originally formed. It is completed finally by the thick translucent striated zone surrounding the yolk. This zona pellucida is, according to Dr. Foulis, a production, not of the follicular epithelium, but of the yolk itself. It consists merely in the hardening of the outer layers of the yolk. To appreciate the distinction thus raised, it is necessary to consider the origin of the yolk itself. This, according to Pflüger, Waldeyer, and others, is, even in the mammal, in the mature ovum, composed of two parts—the central portion, or principal yolk, being that which immediately surrounds the germinal vesicle. This is, of course, the product of the protoplasmic contents of the primordial or germ-epithelial cell. But to this, according to these authors, there is added at a subsequent stage a layer of yolk, called secondary, investing the primary yolk, and in close contact with the zona pellucida. This, they maintain, is the product of the follicular epithelium, and hence,

from their point of view, it would be equally consistent to say that the zona pellucida was formed from the transformation of the outer yolk-layer or directly from the follicular epithelium. But on Dr. Foulis's view this double source for the yolk in the mature ovum is unneeded, as is shown by excluding the follicular epithelium from any share in the production of the zona pellucida. It may, however, be assumed to take place in part from the conversion of the stromal cells; but this does not seem to be Dr. Foulis's opinion.

It is, then, upon the points as to the non-existence of tubular structures in which the Graafian follicles are formed, the important part played by the stromal tissue in the formation of these follicles, and the mode of origin of the zona pellucida, that the conclusions at which Dr. Foulis has arrived differ so materially from those of the German histologists. His paper is so carefully written, and every step in the developmental process is so fully illustrated, that there seems good ground for believing in the accuracy of the conclusions at which he has arrived.

#### FARADISATION OF THE CORTEX OF THE CEREBRUM.

In a recent memoir, published in the *Gazette Médicale*, M. Bochefontaine gives the results of a series of experiments he has performed with the faradic current applied to the cortical substance of the brain. He considers that the results he has obtained are opposed to the idea of localised centres, since the same effect—as, for example, increase of blood-pressure—occurs when the current is applied to several different points of the cerebral cortex. This is sufficiently evidenced by the free bleeding, and even jets of blood, that occur from the smaller vessels. M. Bochefontaine finds that the effects of the application of a faradic current to the brain are both direct and crossed. He believes he has ascertained the existence of three points at least of the cortex electrification of which manifests a distinct action on the circulation. The frequency of the pulse is sometimes augmented, sometimes diminished; and, as a rule, there is augmentation of the arterial tension, though sometimes the reverse is observed. Now, in all these experiments the vago-sympathetic nerve (for these nerves are united in the dog) was either intact or was divided in the middle of the neck, and M. Bochefontaine suggests, in order to explain the differences of arterial tension observed in different instances, that the electric stimulus applied to the cerebral cortex may sometimes have excited the peripheric cerebral ends of nerve-fibres connected with the nuclei of origin of the pneumogastric, and sometimes those of fibres connected with the superior cervical

ganglion or with the centres of origin of the sympathetic in the cord. To settle this question M. Bochefontaine repeated his experiments, after excising the superior cervical ganglion, the vagus being uninjured, and after section of the vagus between the points where it receives filaments of communication from the superior cervical ganglion of the sympathetic, and where it emerges from the base of the brain. The results he obtained are exceedingly interesting. They show, first, that when the vagi were preserved intact whilst the superior cervical ganglia were excised, faradisation of the external superior frontal convolution, both in front of and behind the cruciform furrow, and in *two* other regions, causes augmentation of the blood-pressure with increased frequency of pulse, these effects being both direct and crossed. Secondly, when the vagi were divided between the above-mentioned points, whilst the superior cervical ganglion of the sympathetic was preserved, electric irritation of the superior external frontal convolution at the same points caused considerable diminution of the intra-carotidean tension, and some retardation of the pulse. These facts show very clearly that amongst the fibres of the corona radiata there are some which, when irritated at the surface of the brain, cause depression of the heart's action through the intermediation of the grey substance of the medulla. An effect is thus obtained which is analogous to that produced by faradisation of the nerve of Cyon in the rabbit.

Other observations have been made by M. Bochefontaine which we may briefly mention, since they possess a certain interest in pathology. He has discovered at least three points of the cerebral cortex faradisation of which produces hypersecretion of the submaxillary glands. He has also noticed that stimulation of the dura mater produces the same effect. He finds, moreover, that in one cerebral lobe there are *four* points which when excited produce energetic contraction of the spleen, and *six* which, when excited, cause contraction of the intestines. In one of these experiments the bladder also discharged its contents as soon as the current was applied. In attempting to give an explanation of these curious facts, M. Bochefontaine maintains that they are essentially of reflex nature, and that just as faradisation of the centric extremity of a divided sciatic nerve increases arterial tension and causes movements of the limbs by reflection from the cord and medulla oblongata, so on irritation of the cortex of the brain, fibres are stimulated which react on the heart and other organs through the same centres. However we may explain the phenomena observed, it must be admitted that they present considerable physiological interest.

## THE STRUCTURE OF THE PONS VAROLII.

A COMMUNIOATION of MM. Sappey and Duval to the Académie des Sciences, "On the Course of the Tracts which connect the Brain and the Spinal Cord," adds considerably to our knowledge of an obscure part of the anatomy of the nervous system. Hitherto the elements of the cord have been distinguished no further than the medulla. The work of MM. Sappey and Duval is an attempt to trace them through the pons Varolii. The authors divide the antero-lateral columns of the cord into two parts—the antero-internal, between the anterior median fissure and the anterior horns, and the antero-lateral, between the anterior and posterior horns. The fibres of the first of these decussate throughout the greater part of the spinal cord, taking an important part in the formation of the anterior commissure. These columns in the medulla and pons are separated from the rest, and recede from the surface, so as to occupy, first, the central, and then the posterior part of the medulla; ascending through the pons, they reach the crura, and ultimately pass into the optic thalami. The decussation of the pyramids is formed exclusively by the lateral columns, which cross in successive layers, isolating the remains of the anterior horns—an arrangement which is now generally accepted. In forming the chief part of the anterior pyramids, they separate the antero-internal columns, which are ultimately situated immediately behind the prolongation upwards of the anterior pyramids. The posterior columns of the cord decussate in the medulla above the decussation of the anterior pyramids. They pass forwards, and break up into twelve or fifteen bundles, which cut off the posterior horn, pass through its deep extremity, and ultimately skirt the grey substance, which is situated in front of the central canal of the medulla, to pass to the opposite side. Thus they form a triangular raphe, the base of which is posterior. Soon this triangular raphe becomes elongated from before backwards, and separates the antero-internal columns, so as to become contiguous to the motor part of the pyramids, and form their deep (or sensitive) layer. The posterior columns thus preserve, in the medulla, the same relation to the lateral columns which they occupied in the cord. In the pons the two become separated by a layer of grey substance; the sensitive part becomes considerably modified, and becomes more and more external. It occupies the outer part of the cerebral peduncles, and enters the optic thalami with the antero-internal columns.



## Medical Annotations.

"Ne quid nimis."

### THE "PROS" AND "CONS" OF A SEA VOYAGE.

THE ingredients of a prescription are assumed to be, and certainly always should be, well known to the prescriber. We take it, however, that a large proportion of those practitioners who prescribe a sea voyage for this or that patient are not at all familiar with the vast variety of material that goes to make up the mixture. It matters not whether the invalid be ordered to America, Australia, Egypt, the Cape, or Madeira, whether he travel by steam or sailing ship, whether or not he be affected with sea-sickness, there are, common to all sorts of water travel, little peculiarities, regarded by most as huge discomforts, that the uninitiated dream not of. The favorable side of the subject is familiar to all. Quiet, rest, regular hours, pure air, salt-water baths, a genial climate, with abundant food, are a summary of advantages offered to the sick man who seeks to recruit health by a sea voyage. The recommendations are to a certain extent genuine, but must be taken with several grains of salt. And the qualifying circumstances are tolerably constant, exist to a greater or less extent in all lines of ships, and are in some cases unavoidable. Fresh air, for example, is quoted as an inestimable advantage in sea travel. But, until the ventilation of passenger ships is far more studied than at present, the passenger has, perforce, whenever a gale is blowing, or decks are being washed, to live in an atmosphere quite as close and unhealthy as that of a crowded ball-room, and this sometimes for several days together. If a steamship be chosen, the change of climate consequent upon rapid travelling is trying, and sometimes dangerous, and in a sailing vessel the delays that arise on account of light or foul winds are often equally detrimental to comfort. The evenings in a tropical sea are often intensely hot and the early mornings chilly, so that sleeping on deck is, as a rule, an unwise proceeding. But the traveller is compelled to pass the night below in a superlatively stuffy atmosphere, the transition from which to that on the deck above is often too marked and too sudden to be otherwise than provocative of catarrh and some revival of an old chest affection. It is, as we believe, quite as difficult for the invalid to clothe cleverly on board ship as in England, and this is saying a great deal. There is (partly perhaps from *enroué*) a constant pulling out of portmanteaus, warm garments being wanted one day, airy costumes the next, and so on; so that, in spite of the *dolce far niente* theory, a great deal of anxious thought, and many minutes out of the twenty-four hours, are consumed in questions of raiment. What we shall eat and what we shall drink are two other very important matters. On all good passenger ships the fare provided is always ample in quantity, and as a rule satisfactory in quality. Breakfast at half-past eight, luncheon at one, and dinner at six o'clock form the *rôle* of meals, supplemented by coffee in the early morning and evening. The wines and other drinks provided are neither better nor worse than those obtainable at an ordinary hotel in England, and ice is nearly always carried. In

spite, however, of the abundance of fresh meat and bread, both very good and wholesome, invalids and convalescents, if the passage extends over ten days or a fortnight, invariably complain of a monotony, and a so-called "ship" flavor in the food served to them—in the presence, too, of a very fair appetite. Condensed water is commonly used in steamships, and is unpalatable to many people, as there is usually little opportunity for its proper aeration before drinking. And the difficulty that always exists to some extent of obtaining sufficient exercise is of itself an unfavorable circumstance. And, lastly, there is the natural antipathy (common to so many Englishmen) to the constant company of strangers. Unless your patient is blessed with a tolerably good income, he cannot afford to pay for three or four berths in order to secure a cabin for himself, and so must always run the risk of being quartered with two or three other travellers whose personal habits may be peculiar and not always pleasant. A restless man above or a noisy man below you, a person who is in and out of the cabin at all times of the night, and insists upon lighting his pipe just outside your door, are decided but unavoidable nuisances afloat. It may be argued by some that invalids, in common with other people, must meet with inconveniences everywhere, and if not prepared to put up with them had better stay at home. But it should be remembered that on board ship we cannot, if so disposed, move to other quarters, and there can be no doubt that very few of us who want change and rest will, under any circumstances, be really comfortable afloat for more than five or six days, putting aside altogether the miseries of sea-sickness. It is therefore advisable, and, as we think, not a work of supererogation, to remind our readers that, even in these days of indiscriminate travel, much careful judgment should be exercised before the patient is advised to go to any place necessitating a long sea voyage, however freely convinced the consultant may be that sea air, salt water, and a temperate climate, are likely to cure his patient.

### MORPHIA DISEASE.

THE vast abuse of narcotics in modern society is becoming a serious evil. There is no denying the fact that in countries where no administrative control of chemist-shops exists, as in England and America, the public has too easy access to such drugs. The report of the Medical Officer to the Privy Council on the use of laudanum in the industrial districts of England for the purpose of keeping infants quiet startled its readers some years ago. It is not long since a political weekly contemporary boldly contended that chloral was to be found in the workboxes and baskets of nearly every lady in the West-end "to calm her nerves." Chloral-punch had become an "institution" in the drinking-saloons of New York scarcely a year after its introduction into medical practice. Now we hear from sober, orderly, and paternally ruled Germany that there is such a thing as morphia disease spreading amongst its population. The easy application of subcutaneous injections left to the patients themselves or their attendants by indulgent practitioners has proved so tempting to persons afflicted with bodily or mental pain that they have taken to habitually practising them, and, of course,

as in the case of the continued and uncontrolled internal use of opium, alcohol, or chloral, the effect soon becoming weaker, the dose has been increased, and, in some cases related by the physician of the private maison de santé at Berlin in the *Klin. Wochenschrift*, reached the amount of from 12 to 16 grains per diem. The symptoms seemed to be very much like those of opium-eating. One lady took to morphia injections, after she had become acquainted with their effect in an attack of gall-stone colic, during the French war, when the anxiety about her male relations in the field weighed too heavily on her mind to stand the mental stress. After she had practised the soothing operation four years, her face showed a greyish-leadene hue, the pupils became the size of a pin's head, and her monthly periods had ceased, though she was only thirty-three years old and married. Violent shiverings after the type of tertian fever, hyperæsthesia and neuralgia, dislike for meat diet, great weakness, inability to pursue any continued occupation, existed, with unimpaired intellect and memory, in the well-educated and clever patient. She was cured in the space of four weeks by gradual deprivation of the drug. Her catamenia returned in ten days. If patients subject to this kind of disease become aware of their state they are apt to change it into alcoholism. The wife of a medical man who saw in a book on *Materia Medica* that alcohol was considered an antidote for morphia became a confirmed drunkard. The author observed four similar cases. In two other cases the patients committed suicide, and two died from marasmus. These last four had refused medical treatment.

The task of the physician seems to be always a very difficult one, as it is impossible to wean these persons from their habit unless they are treated like prisoners, searched before admission to the hospital or sick-room, put under the guard of attendants inaccessible to bribery, and cut off from all communication with the outer world before the critical time has passed. The most highly educated and otherwise respectable will tell any amount of lies and perjure themselves to procure the accustomed poison. Like dipsomania and opium-eating, the morphia disease degrades the moral character. Twelve hours after the stoppage of the morphia injections a severe collapse generally ensues, and it is advisable to keep the patient for a week in bed. Wine and ammonia may be given, the latter injected, but alcoholic stimulants are, for the reason stated, to be used sparingly. Wild excitement and depression follow in alternation. The tepid bath, with or without cold effusion, a mild generous diet, and an occasional dose of chloral will be useful. Generally, after some days, diarrhoea of a critical character sets in and lasts from a week to a fortnight, without requiring any remedy but two or three warm water enemata during the day. Uncontrollable vomiting may necessitate nutrition by means of an enema. If no diarrhoea makes its appearance, and the usual behavior and cheerfulness of the patient remain unaltered, the physician can be sure that he has been able to partake of morphia in secret. Experience seems to make it advisable to deprive people suffering from this disease at once and entirely of the drug. Their wilfulness and liability to relapses are, however, so great that only about 25 per cent. have been seen to recover in a large series of cases.

The moral treatment, by urging them early to some kind of steady work, is particularly to be insisted upon.

#### SIZE OF THE ULTIMATE ATOMS OF MATTER.

In a recent remarkable address delivered before the Royal Microscopical Society by Mr. Sorby, an attempt is made to determine the size of the ultimate atoms of matter. Experiments recently made by Dr. Royston-Pigott, a well-known microscopist, satisfied him that the smallest visual angle we could distinctly appreciate was a hole one inch and a quarter in diameter at a distance of 1100 yards, which corresponds to about 6" of arc. This visual arc in a microscope magnifying 1000 linear would correspond to about the three-millionth part of an inch; on various grounds, however, Mr. Sorby is inclined to think that a size between 1-80000 and 1-100000 of an inch is about the limit of the visibility of minute objects, even with the best microscopes. He then proceeds to consider the relation this magnitude bears to the size of the ultimate atoms of organic and inorganic matter, and shows in the first instance that the mean of the calculations made by Stoney, Thomson, and Clerk-Maxwell gives 21770 as the number of atoms of any permanent gas that would lie end to end in the space of 1-1000 of an inch in length. The cube of this mean is about 10,817,000,000,000, which represents the number of atoms in a space of 1-1000 of an inch cube, that is in 1-1000000000 of a cubic inch. But if the gas containing this number of atoms consisted of two volumes of hydrogen to one of oxygen, when combined to form vapor of water, there would be a condensation of volume from three to two, and on condensing to liquid a further contraction to 1-770 of the bulk of the vapor. Each molecule of water would, however, consist of three atoms of gas, and hence the number of molecules of liquid water in 1-1000 of an inch cube would amount to about 8,972,000,000,000,000. A similar train of reasoning applied to albumen in the form of horn leads to the result that in a cube of 1-1000 of an inch there are about 71,000,000,000,000 molecules. According to these principles there would be in the length of 1-80000 of an inch (the smallest visible object), about 2000 molecules of water or 520 of albumen, and therefore, in order to see the ultimate constitution of organic bodies it would be necessary to use a magnifying power of from 500 to 2000 times greater than those we now possess. These, however, would be of no use unless the waves of light were some 1-2000 part of the length they are, and our eyes and instruments correspondingly perfect. As matters now stand we are about as far from a knowledge of the ultimate structure of organic bodies as we should be of the contents of a newspaper seen with the naked eye at a distance of a third of a mile, under which circumstances the letters of various sizes would correspond to the smaller and larger ultimate molecules. This being the case, the particles of organic matter may differ in an almost infinite number of structural characters, just as any number of different newspapers in various languages or with varying contents would look alike at a distance of a third of a mile. The bearing of these calculations, as Mr. Sorby shows, is important on the physical

aspect of Darwin's doctrine of pangenesis, and he thinks they are, upon the whole, favorable to that theory.

#### WOUNDS OF THE HEART.

A REMARKABLE case of prolonged survival after a severe wound of the heart has lately occurred at Lowestoft, under the care of Mr. W. H. Clubbe, of that town. The following facts, given in evidence before the coroner, we glean from the local paper, the *Mercury*. It seems that a man named Ellis had some cause of disagreement with his step-father, named Boast. On Sunday, April 9th, Ellis attacked Boast on the beach at Lowestoft, and stabbed him in the chest close to the left breast. After the receipt of the wound, the deceased walked about fifteen yards into a neighbor's house, and did not die until the following Wednesday morning (April 12th), having survived his wound sixty-four hours. The following extract from Mr. Clubbe's evidence gives a most accurate and concise account of the post-mortem appearance:—

"The wound I have referred to was two inches above and a little to the right of the left nipple. Externally it measured have an inch in the direction of the long axis of the body. This wound penetrated the walls of the chest between the third and fourth ribs. It passed through the pericardium and substance of the heart into the cavity of the left ventricle of the heart. The left cavity of the chest was filled with blood, so that the left lung was compressed into a small compass towards the spine. The right lung was expanded, the heart itself was empty, but there was some blood in the pericardium. The liver and kidneys contained very little blood, and were both diseased. There was a quantity of blood found in the soft structures of the walls of the chest, particularly in the neighborhood of the wound. Death arose from internal hæmorrhage, resulting from the wound I have described."

The most urgent symptom presented by the deceased during life was dyspnoea, but even this was only observable after the first 24 hours. The physical signs were dulness over the heart and left lung and absence of respiratory murmur, but over the right lung there was marked puerile breathing. The absence of faintness was very noteworthy, and the pulse was tolerably good to the last, but the effort of sitting up in bed to take food seems to have determined the fatal syncope. The jury returned a verdict of "Wilful murder" against Ellis, which, indeed, was the only course open to them.

A case of a similar kind occurred a short time since at University College Hospital, in which a man had committed suicide by firing two shots into his body, the first lodging in the chest and the second in the head. The post-mortem examination revealed the fact that the first bullet had penetrated the pericardium, and had actually grooved the surface of the left ventricle. Notwithstanding the serious wound of his heart, the deceased had been able, after its infliction, to re-load his pistol (a single-barreled Deringer) and inflict the wound in the head which proved fatal to him.

#### DR. BONWILL'S METHOD OF INDUCING ANÆSTHESIA.

In an introductory lecture by Dr. A. Hewson at Pennsylvania Hospital, reported in the *Philadelphia Medical Times*, there is a description of a method of diminishing or allaying sensibility by rapid inspirations, known as Dr. Bonwill's method, which is alleged to be efficacious and applicable to cases where some measures are required to diminish emotional dread, or induce such an amount of insensibility as will admit of the patients being manipulated or examined with the requisite degree of ease. As the effect of rapid and deep respirations after violent running, or of blowing hard to ignite a fire, a certain amount of confusion of sight and bewilderment of mind is sometimes experienced. With these effects Dr. Bonwill recognised that some numbness of the sentient nerves was associated, and, pursuing the subject further, he was enabled to bring it to practical use in his profession—that of dentistry. It was from a demonstration of the power of this method of procedure to induce sufficient anæsthesia to allow of the painless extraction of a tooth that Dr. Hewson was led to study the subject. He states that he has used it with gratifying results in stitching wounds, in handling over-sensitive parts, and in probings and the like. In a case where a boy had sustained a severe sprain of the left wrist from a fall upon the ice, the patient was directed to respire rapidly, which he did for two and a half minutes, when the injured wrist was freely manipulated without pain. In some other cases, owing to the nervousness of the patients, they could not be got to continue the rapid respirations, and the experiments failed; but Dr. Bradford, the resident surgeon of the Pennsylvania Hospital, was induced to try the process himself in the presence of the class. It was his first attempt, and it was made while in the sitting position. Breathing rapidly for about three minutes was, first of all, attended with a tingling sensation, especially of the tips of the fingers, and a feeling as though the surface was swelling. Then there followed a dizziness or confusion in the head, without loss of consciousness, but with an inability to resist or act independently. He had no recollection of being hurt by a pin, which he found had been stuck into his flesh whilst anæsthetic from this rapid breathing.

#### TRANSMISSION OF RINGWORM FROM HORSE TO MAN.

THE transmission of the epiphytic disease, *Tinea tonsurans*, to man (says the *Veterinary Journal*), though long ago fully established as possible, yet is not so common an occurrence as to justify us in withholding from publication an interesting case which recently came under observation. A short time ago Lieutenant P—, belonging to the mounted portion of the Royal Engineers, purchased as a charger a well-bred, fine-skinned brown horse, five years of age. A few days after the horse joined, a few small "pimples," supposed to be due to surfeit, were observed on the left side of the croup and quarter, but nothing was thought of them. Soon, however, in consequence of the rapidity of their spread, attention was directed to them, when the skin in the region named was found closely sown with patches and points, due to the rapidly fructifying conidia of the *Tricho-*

*phlyon*. The disease had evidently been in existence for a long time. About the middle of March, the groom who had attended the horse since its arrival in barracks came to know whether a sore place on his arm was due to the disease which had affected the animal's skin. There undoubtedly was an unmistakable patch of *Tinea circinata*, measuring one and a half inch in diameter, on the inner aspect of the right arm, a little above the wrist. The patch was regularly circular in outline; the margin being well defined; the base was much inflamed, particularly at the circumference; there were no vesicles, these having in all probability been ruptured by the bandage which had been wrapped round the arm. The irritation had been so great as to excite pustulation in the centre of the patch, where, as well as at the border, there was so much infiltration as to raise the diseased portion of the skin above the surrounding level; here and there were whitish scales covering the infiltrated surface. This pathological condition of the cutis had only been in existence for two or three days, and the growth of the fungus had been so rapid that the groom himself was astonished at the speed with which a little red spot had become a large sore place. The man was placed under the care of the regimental surgeon.

#### ORIGIN OF UREA IN THE BODY.

In a recent paper on this subject (*Centralblatt*, No. 53, 1876), Dr. Salkowski observes that the principal facts at present known bearing on this point are that certain amido-acids, after their ingestion into the alimentary canal, appear in the urine in the form of uramid-acids or combinations of amido-acids with the group CONH. 2. Certain other amido-acids, such as glycocoll, leucin, asparaginic acids, which are products of the disintegration of albumen, when administered with the food, lead to augmented excretion of urea. 3. After the ingestion of sal ammoniac, the greater part of the nitrogen appears as urea in the urine. 4. In the course of the oxidation of glycocoll, leucin, &c., in an alkaline solution outside the body, carbaminic acid is formed, the salts of which are found in the blood. On repeating and extending the researches that led to the above conclusions, he has satisfied himself that at some stage of the disintegration of nitrogenous substances cyanic acid (or carbaminic acid) is formed in the body; secondly, that both glycocoll and sarcosin cause considerable increase in the amount of urea excreted, without producing more than a small increase of the amount of disintegration of the albumen; and, thirdly, he agrees with Drechsel in thinking that albumen ingested as food breaks up into leucin, tyrosin, &c.; these undergo oxidation, and form carbamate of soda, which splits up, perhaps under the influence of a ferment, into urea and carbonate of soda.

#### INNERVATION OF THE THYROID GLAND.

M. POINCARÉ, in the just published part (p. v., 1876) of *Robin's Journal de l'Anatomie*, states that he has been struck with the great richness of this gland in nervous filaments of all sizes. This is the more curious since the gland presents no remarkable indications either of sensibility or motility. No doubt the gland contains a large number of vessels, which require, consequently, many

vaso-motor fibres, but the nervous supply is out of proportion to what may be supposed requisite for this purpose, and M. Poincaré thinks this peculiarity accounts in some measure for the close relationship known to exist between the thyroid gland and the generative organs, and believes that many of them are of a sensory nature. The nerves form close plexuses surrounding small islets of the substance of the gland, and the branches passing to and from the gland stand (as he expresses it) in the relation of telegraphic cables between the thyroidean colony and the metropolitan cerebro-spinal axis. To continue the simile, the colony has itself an autonomous system of telegraphy, the stations being represented by numerous microscopic ganglia, with connecting branches which do not pass outside the gland. The best means of examining the nerves of the gland he finds to be, not hardening agents such as osmic acid, but softening and disintegrating agents, and he has obtained good results from maceration in water acidulated with acetic acid, and slightly colored with fuchsin.

#### THE EFFECT OF PROLONGED MUSCULAR EXERCISE ON THE SYSTEM.

By F. W. PAVY, M.D., F.R.S.

(Continued from June No., p. 288.)

THE walk Mr. Weston has just accomplished will complete the series of observations I have undertaken. The task he had in hand was to walk a distance of 500 miles in six consecutive days. In order that the information to be obtained may be made as complete as possible, observations have been conducted during the six days prior to the walk; they will be carried on during the six days of the walk, and extend for a short period afterwards. Thus, greatly additional data will be supplied for forming deductions hereafter upon tissue-waste in relation to muscular action. A calculation can be made of the amount of mechanical work each day performed, and from a knowledge of the ingesta, and the products of disintegration eliminated, an estimate can be formed of the source of the power manifested. In the former analyses—those particularly referring to the period of walking—the portion of the solid matter of the urine falling under the head of “other organic matters” forms an item of considerable significance. This may in part consist of other nitrogenous products of disintegration besides urea and uric acid, and with a view of deciding whether such is the case, and at the same time rendering the results more conclusive, the amount of nitrogen in each of the present series of observations is being determined by combustion analysis; but on account of the time involved in the operation, the publication of the figures must be delayed till a later period.

During the greater portion of the six-days period to which the subjoined report refers, Mr. Weston was staying at Brighton, and my friend Mr. Salzmänn kindly undertook the requisite supervision. To him I am indebted for the particulars, which are from actual weighing, regarding the food consumed, and the other observations made, and for the daily despatch of the urine to my laboratory for analysis.

During the first two days Weston kept entirely to the house, and during the last four the amount of walking performed did not reach twenty miles. The results, therefore, well represent a state of comparative rest.

*First twenty-four hours of the six-day period prior to the 500 miles walk (11 p.m. Feb. 28th to 11 p.m. Feb. 29th).—*Amount of urine passed, 2271·7 c.c. (80 oz.); specific gravity, 1018·46; free acidity, reckoned as oxalic acid, ·63 gramme in 1000 c.c. (.276 grain in 1 oz.); amber color, clear. Microscopic characters: Crystals of oxalate of lime. Composition in 1000 parts:—

|                                  |     |        |
|----------------------------------|-----|--------|
| Water                            | ... | 964·75 |
| Solid residue (dried at 240° F.) | ... | 35·25  |

Incinerated residue ... 12·19

|                       |     |            |
|-----------------------|-----|------------|
| Organic constituents— |     |            |
| Urea                  | ... | 17·18      |
| Uric acid             | ... | ·56        |
| Other organic matters | ... | 5·32—23·06 |
| Mineral constituents— |     |            |
| Chlorine...           | ... | 4·37       |
| Sulphuric acid        | ... | 1·82       |
| Phosphoric acid       | ... | ·94        |
| Soda                  | ... | 2·99       |
| Potash                | ... | 2·04       |
| Lime                  | ... | ·10        |
| Magnesia              | ... | ·08        |
| Loss                  | ... | ·35—12·19  |
|                       |     | 35·25      |

Total quantity of solids excreted during the twenty-four hours:—

|                       |     |                                |
|-----------------------|-----|--------------------------------|
| Urea                  | ... | 89·760 grammes (618·11 grains) |
| Uric acid             | ... | 1·296 " (19·90 " )             |
| Other organic matters | ... | 12·814 " (189·94 " )           |
| Chlorine              | ... | 10·110 " (115·99 " )           |
| Sulphuric acid        | ... | 3·049 " (47·06 " )             |
| Phosphoric acid       | ... | 2·181 " (33·64 " )             |
| Soda                  | ... | 6·929 " (106·93 " )            |
| Potash                | ... | 4·726 " (72·83 " )             |
| Lime                  | ... | ·257 " (3·96 " )               |
| Magnesia              | ... | ·204 " (3·15 " )               |

*Food consumed:* 12½ oz. cooked meat (chop, exclusive of bone, and steak); 2 eggs; 11½ oz. bread; 8½ oz. dry toast; ½ oz. biscuit; 2 oz. currant cake; 7½ oz. potatoes; 3½ oz. butter; 1 oz. currant jam; 2 dried figs; 1 pint of coffee, and 1½ pints of tea, with milk and sugar.

Body-weight, without clothes, at 11 p.m. Feb. 28th, 9 st. 6 oz. Temperature in mouth, 100°.

*Second twenty-four hours of the six-day period prior to the 500 miles walk (11 p.m. Feb. 29th, to 11 p.m. March 1st).—*Amount of urine passed, 1774·8 c.c. (62½ oz.); specific gravity, 1021·88; free acidity, reckoned as oxalic acid, ·63 gramme in 1000 c.c. (.276 grain in 1 oz.). Amber color, slightly cloudy. Microscopic characters: Crystals of uric acid and oxalate of lime. Composition in 1000 parts:—

|                                  |     |        |
|----------------------------------|-----|--------|
| Water                            | ... | 961·23 |
| Solid residue (dried at 240° F.) | ... | 38·77  |

Incinerated residue ... 13·02

Organic constituents—

|                       |     |            |
|-----------------------|-----|------------|
| Urea                  | ... | 22·51      |
| Uric acid             | ... | ·84        |
| Other organic matters | ... | 2·40—25·75 |
| Mineral constituents— |     |            |
| Chlorine...           | ... | 5·68       |
| Sulphuric acid        | ... | 1·48       |
| Phosphoric acid       | ... | 1·53       |
| Soda                  | ... | 2·58       |
| Potash                | ... | 1·38       |
| Lime                  | ... | ·13        |
| Magnesia              | ... | ·17        |
| Loss                  | ... | ·13—13·02  |
|                       |     | 38·77      |

Total amount of solids excreted during the twenty-four hours:—

|                       |     |                                |
|-----------------------|-----|--------------------------------|
| Urea                  | ... | 40·820 grammes (629·85 grains) |
| Uric acid             | ... | 1·526 " (23·60 " )             |
| Other organic matters | ... | 4·380 " (66·80 " )             |
| Chlorine              | ... | 10·293 " (158·77 " )           |
| Sulphuric acid        | ... | 2·591 " (39·96 " )             |
| Phosphoric acid       | ... | 2·751 " (42·43 " )             |
| Soda                  | ... | 4·231 " (65·11 " )             |
| Potash                | ... | 2·500 " (38·57 " )             |
| Lime                  | ... | ·248 " (3·86 " )               |
| Magnesia              | ... | ·828 " (5·13 " )               |

*Food consumed:* 18½ oz. cooked meat (chops, exclusive of bone, and steak); 2 eggs; 2 oz. Brand's concentrated beef-tea extract made into beef-tea; 5½ oz. of bread spread with butter; 10 oz. dry toast; 2½ oz. cake; 1 oz. oatmeal in the form of gruel; 6 oz. potatoes; 6 oz. cabbage; 2½ oz. black-currant jam; 3 dried figs (2 oz.); 1 pint of coffee, and 1½ pints of tea, with milk and sugar.

Body-weight, without clothes, at 11 p.m. Feb. 29th, 9 st. 6 oz. Temperature in mouth, 100°.

*Third twenty-four hours of the six-day period prior to the 500 miles walk (11 p.m. March 1st, to 11 p.m. March 2nd).—*Amount of urine passed, 993·9 c.c. (35 oz.); specific gravity, 1026·43; free acidity, reckoned as oxalic acid, 1·5 grammes in 1000 c.c. (1·66 grain in 1 oz.); highly turbid from deposit of lithate. Microscopic characters: Amorphous lithate of soda. Composition in 1000 parts:—

|                                  |     |        |
|----------------------------------|-----|--------|
| Water                            | ... | 948·90 |
| Solid residue (dried at 240° F.) | ... | 56·20  |

Incinerated residue ... 14·82

Organic constituents—

|                       |     |            |
|-----------------------|-----|------------|
| Urea                  | ... | 81·17      |
| Uric acid             | ... | ·49        |
| Other organic matters | ... | 9·72—41·38 |
| Mineral constituents— |     |            |
| Chlorine...           | ... | 4·15       |
| Sulphuric acid        | ... | 2·34       |
| Phosphoric acid       | ... | 2·29       |
| Soda                  | ... | 3·41       |
| Potash                | ... | 1·99       |
| Lime                  | ... | ·14        |
| Magnesia              | ... | ·18        |
| Loss                  | ... | ·37—14·82  |
|                       |     | 56·20      |

Total quantity of solids excreted during the twenty-four hours:—

|                                   |                                |             |
|-----------------------------------|--------------------------------|-------------|
| Urea ... ..                       | 81.804 grammes (490.87 grains) |             |
| Uric acid ... ..                  | .507 "                         | (7.81 " )   |
| Other organic mat-<br>ters ... .. | 9.879 "                        | (152.48 " ) |
| Chlorine... ..                    | 4.423 "                        | (68.20 " )  |
| Sulphuric acid ...                | 2.385 "                        | (36.72 " )  |
| Phosphoric acid ...               | 2.385 "                        | (35.95 " )  |
| Soda ... ..                       | 3.479 "                        | (53.69 " )  |
| Potash ... ..                     | 2.027 "                        | (31.32 " )  |
| Lime ... ..                       | .149 "                         | (2.30 " )   |
| Magnesia ... ..                   | .187 "                         | (2.11 " )   |

*Food consumed:* 15½ oz. cooked meat (chop, exclusive of bone, and roast mutton); 2 eggs; 2½ oz. Brand's concentrated beef-tea extract made into beef-tea; 8½ oz. bread spread with butter; 5½ oz. dry toast; 6½ oz. pudding; 1 oz. oatmeal in the form of gruel; 12 oz. potatoes and greens; 3 oz. black-currant jam; 3 dried figs (2 oz.); ½ pt. of coffee and 1½ pt. of tea, with milk and sugar.

Body-weight, without clothes, at 11 p.m. March 1st, 8 st. 12 lb. Temperature in month, 99.5°.

*Fourth twenty-four hours of the six-day period prior to the 500 miles walk (11 p.m. March 2nd, to 11 p.m. March 3rd).*—Amount of urine passed, 1987.8 c.c. (70 oz.); specific gravity, 1024.9. Clear, amber color. Free acidity, scarcely appreciable. Microscopic characters: Crystals of oxalate of lime. Composition in 1000 parts:—

|                                  |        |
|----------------------------------|--------|
| Water ... ..                     | 960.27 |
| Solid residue (dried at 240° F.) | 89.73  |

Incinerated residue ... 14.42

|                                   |            |
|-----------------------------------|------------|
| Organic constituents—             |            |
| Urea ... ..                       | 24.03      |
| Uric acid ... ..                  | 1.08       |
| Other organic mat-<br>ters ... .. | 0.20—25.81 |
| Mineral constituents—             |            |
| Chlorine... ..                    | 4.36       |
| Sulphuric acid ...                | 2.08       |
| Phosphoric acid ...               | 1.85       |
| Soda ... ..                       | 8.61       |
| Potash ... ..                     | 3.02       |
| Lime ... ..                       | .07        |
| Magnesia ... ..                   | .03        |
|                                   | 14.42      |
| Less excess ... ..                | .60        |
|                                   | 89.73      |

Total quantity of solids excreted during the twenty-four hours:—

|                                   |                                 |             |
|-----------------------------------|---------------------------------|-------------|
| Urea ... ..                       | 48.955 grammes (755.273 grains) |             |
| Uric acid ... ..                  | 2.207 "                         | (33.95 " )  |
| Other organic mat-<br>ters ... .. | .407 "                          |             |
| Chlorine ... ..                   | 8.999 "                         | (187.82 " ) |
| Sulphuric acid... ..              | 4.254 "                         | (64.80 " )  |
| Phosphoric acid ...               | 3.780 "                         | (58.68 " )  |
| Soda ... ..                       | 7.355 "                         | (112.64 " ) |
| Potash ... ..                     | 6.361 "                         | (96.75 " )  |
| Lime ... ..                       | .146 "                          | (2.20 " )   |
| Magnesia ... ..                   | .060 "                          | (.91 " )    |

*Food consumed:* 19 oz. cooked meat (cold roast mutton and steak); 10 oz. fish (fried sole); 2 eggs; 9½ oz. bread spread with butter; 6½ oz. dry

toast; 5 oz. apple dumpling; 1 oz. oatmeal in the form of gruel; 10½ oz. potatoes; 1 pint of coffee, and 1½ pints of tea, with milk and sugar.

Body-weight, without clothes, at 11.30 p.m., March 2nd, 8 st. 18 lb. 6 oz. Temperature in month, 99°.

*Fifth twenty-four hours of the six-day period prior to the 500 miles walk (11 p.m. March 3rd, to 11 p.m. March 4th).*—Amount of urine passed, 1760.6 c.c. (62 oz.); specific gravity, 1020.14. Dark amber color; free acidity scarcely appreciable. Microscopic characters: Crystals of oxalate of lime. Composition in 1000 parts:—

|                                  |        |
|----------------------------------|--------|
| Water ... ..                     | 961.93 |
| Solid residue (dried at 240° F.) | 88.07  |

Incinerated residue ... 8.61

|                                   |            |
|-----------------------------------|------------|
| Organic constituents—             |            |
| Urea ... ..                       | 25.48      |
| Uric acid ... ..                  | 1.47       |
| Other organic mat-<br>ters ... .. | 3.51—29.46 |
| Mineral constituents—             |            |
| Chlorine... ..                    | 2.16       |
| Sulphuric acid ...                | 2.09       |
| Phosphoric acid ...               | 1.57       |
| Soda ... ..                       | 1.54       |
| Potash ... ..                     | 1.22       |
| Lime ... ..                       | .09        |
| Magnesia ... ..                   | .08        |
|                                   | 8.61       |
| Less excess ... ..                | .14        |
|                                   | 88.07      |

Total quantity of solids excreted during the twenty-four hours:—

|                                   |                                |            |
|-----------------------------------|--------------------------------|------------|
| Urea ... ..                       | 45.760 grammes (705.15 grains) |            |
| Uric acid ... ..                  | 2.640 "                        | (40.78 " ) |
| Other organic mat-<br>ters ... .. | 6.301 "                        | (97.21 " ) |
| Chlorine... ..                    | 3.696 "                        | (56.94 " ) |
| Sulphuric acid ...                | 3.766 "                        | (58.02 " ) |
| Phosphoric acid ...               | 2.816 "                        | (43.36 " ) |
| Soda ... ..                       | 2.768 "                        | (42.59 " ) |
| Potash ... ..                     | 2.200 "                        | (33.95 " ) |
| Lime ... ..                       | .176 "                         | (2.72 " )  |
| Magnesia ... ..                   | .140 "                         | (2.16 " )  |

*Food consumed:* 9 oz. cooked meat (steak and cold roast mutton); 9½ oz. fish (boiled cod); 2 eggs; cheese, ½ oz.; bread spread with butter, 11 oz.; dry toast, 2 oz.; oatmeal, 1 oz., in the form of gruel; haricot beans, 10 oz.; 8 figs (2½ oz.); coffee 2 pints, and tea ½ pint, with milk and sugar.

Body-weight, without clothes, at 11 p.m. March 3rd, 8 st. 12 lb. 14 oz. Temperature in month, 99°.

*Sixth twenty-four hours of the six-day period prior to the 500 miles walk (11 p.m. March 4th to 11 p.m. March 5th).*—Amount of urine passed, 2214.9 (78 oz.); specific gravity, 1021.34; amber color, clear. Free acidity, reckoned as oxalic acid, 1.26 grammes in 1000 c.c. (.55 grain in 1 oz.). Microscopic characters: Large number of crystals of uric acid. Composition in 1000 parts:—

|                                  |        |
|----------------------------------|--------|
| Water ... ..                     | 962.93 |
| Solid residue (dried at 240° F.) | 37.67  |

Incinerated residue ... 12.29

|                                   |       |        |
|-----------------------------------|-------|--------|
| Organic constituents—             |       |        |
| Urea ... ..                       | 23.49 |        |
| Uric acid ... ..                  | 1.10  |        |
| Other organic mat-<br>ters ... .. | .79   | —25.38 |
| Mineral constituents—             |       |        |
| Chlorine... ..                    | 3.60  |        |
| Sulphuric acid ...                | 1.72  |        |
| Phosphoric acid ...               | 1.22  |        |
| Soda ... ..                       | 3.13  |        |
| Potash ... ..                     | 2.35  |        |
| Lime ... ..                       | .08   |        |
| Magnesia ... ..                   | .06   |        |
| Loss ... ..                       | .18   | —12.29 |
|                                   |       | 87.67  |

Total quantity of solids excreted during the twenty-four hours:—

|                                   |                                |             |
|-----------------------------------|--------------------------------|-------------|
| Urea ... ..                       | 52.052 grammes (802.86 grains) |             |
| Uric acid ... ..                  | 2.487 "                        | (88.88 " )  |
| Other organic mat-<br>ters ... .. | 1.785 "                        | (27.46 " )  |
| Chlorine ... ..                   | 7.974 "                        | (122.98 " ) |
| Sulphuric acid ...                | 3.809 "                        | (58.78 " )  |
| Phosphoric acid ...               | 2.768 "                        | (42.74 " )  |
| Soda ... ..                       | 7.088 "                        | (109.24 " ) |
| Potash ... ..                     | 5.816 "                        | (82.08 " )  |
| Lime ... ..                       | .199 "                         | (3.07 " )   |
| Magnesia ... ..                   | .155 "                         | (2.39 " )   |

**Food consumed:** 21½ oz. cooked meat (chop, exclusive of bone, and underdone roast beef); 2 eggs; jelly ½ pint; bread 8 oz.; dried toast 4 oz.; 4 biscuits (Huntley and Palmer's); potatoes 12 oz.; haricot beans 8½ oz.; butter 1½ oz.; 2 dozen grapes; 1 dozen prunes; coffee, with milk and sugar.

Body-weight, without clothes, at midnight, March 4th, 9 st. 2 lb. 8 oz.

(To be continued.)

## News Items, Medical Facts, &c.

**TREATMENT OF RHEUMATISM.**—The following *résumé* of 14 cases of acute rheumatism treated in the Boston City Hospital is given in the last number of the *Medical and Surgical Journal* of that town by Dr. Hall Curtis:—

1. No effect from salicylic acid.
2. Alkalies for a month; then acid, eight doses, with relief.
3. Alkalies for twenty days without relief; acid in one day gave relief.
4. Acid for seven days; patient well.
5. Alkalies two days; acid seven days with entire relief.
6. Relief after four doses of acid; this was continued four days. Recovery.
7. Acid three days without relief. Followed by tincture of chloride of iron for fifteen days. Recovery.
8. Alkalies gave relief in four days. Recurrence. Acid given four days with entire relief.
9. Acid three days; no relief. Alkalies for twelve days. Recovery.
10. Acid seven days with entire relief.
11. Acid refused by stomach. Alkalies during eleven days with relief.
12. Acid for nine days. Complete relief after the first four days.
13. Acid five days with relief. Discharged, well, in seven days.

14. Acid seven days; complete relief in three days. Except in one or two instances, the salicylic acid was given in wafers.

**STRANGE DEATH FROM CHLOROFORM.**—We find in the *Lyon Médical* of April 9th the following melancholy story:—A multiparous girl, aged twenty-five, went to the Maternity on the 23rd of March at three in the afternoon. The pains lasted the whole evening and night. On the 24th, at seven in the morning, the waters broke, and the shoulder presented. Chloroform was then administered in order to proceed to version. All this was done under the direction of the sister of charity entrusted with the care of the patients, and she never sent for the house-surgeon or the physician of the hospital. As the patient did not wake after the chloroform inhalation, the house-surgeon was called. He found the pulse thready, the face blue, and the breathing very imperfect. The endeavors to recall the patient to life were unsuccessful, and she died ten minutes after the house-surgeon saw her. Of course no actual scientific explanation could be obtained; but such a case shows the necessity of reform.

**EFFECTS OF INTERMARRIAGES.**—There is (says a correspondent in *The Times*) a little town in the Province of Santander, Spain, Protés by name, which, until eighteen or nineteen years ago, was quite shut off from all the rest of the world. Its inhabitants, from their ever-recurring intermarriages, had become quite a race of dwarfs. On market days might be seen the priests (their concubines riding *en pillion*), with long black coats and high black hats, riding in to purchase the simple provision for the week's consumption—men of little intelligence and no learning, sprung from the lowest ranks. About eighteen years ago the Galician laborers, or Gallegos, from the mines of Galicia, swarmed into the town for lodging &c., and since their colonisation the population has increased in strength, stature, education, intellect, and morality. Their intellects, also, have improved—intellects which had been stunted, dwarfed, and ruined by their frequent intermarriages.

**NEW MODE OF OBTAINING LOCAL ANESTHESIA.**—M. Latamendi has found that when Richardson's apparatus is used, rubefaction and a sensation of cold is produced. If at this moment a slight incision of about half an inch is made with a curved bistoury, not deeper than the epidermis and the upper layer of the cutis, from the incised spot an anemic zone is formed, which goes on spreading. If the ether spray is continued, the region becomes bloodless, and complete anesthesia has been obtained. The knife cuts the part like butter, the spot resembling coagulated fat. Around this an annular patch is observed, which is not so completely anemic as the centre. The spray directed upon this renders it also completely anesthetic. Thus the anemia can be extended in every direction, around and up the arm. If the spray be suspended, the effects disappear quickly; but, the spray being resumed, in a few seconds the ischemia returns.

**NORWEGIAN LEPRO.**—Dr. Neumann, of Vienna, has published in the *Allg. Wien. Med. Zeit.* (March 7th, 1876) a short and able article on the etiology of this disease. Authors are not quite agreed whether it is hereditary or not; but it would appear that it is contagious. Low lands on the coast and bad food and shelter have much to do with the appearance of the disease in both hemispheres. The prognosis is generally very bad; the patients mostly perish of marasmus, pneumonia, phthisis, albuminuria, &c. The author makes a statement which, at least as regards Scotland, would require confirmation. He says that in Norway the vas deferens of boys affected with lepra is tied to arrest procreation, and that in Scotland castration is performed upon leprous lad for the same purpose.

**AN OLD MEDICAL BOOK.**—It is reported that the learned Orientalist, Evers, has just discovered at Cairo a medical book written 8500 years ago. The time of publication is coeval with the rule of Joseph in Egypt.

PRINTED AND PUBLISHED BY

Wm. C. HERALD, Nos. 32 & 34 JOHN ST., NEW YORK.



# THE LANCET.

A Journal of British and Foreign Medicine, Physiology, Surgery,  
Chemistry, Criticism, Literature, and News.

JAMES G. WAKLEY, M.D., M.R.C.S., EDITOR.

PUBLISHED MONTHLY.

No. 8.

NEW YORK, AUGUST, 1876.

## A Clinical Lecture

ON

### TRIPLE PERICARDIAL FRICTION-SOUND, AND ON REDUPLICATION OF THE FIRST SOUND OF THE HEART.

By GEORGE JOHNSON, M.D., F.R.S.,

Professor of Clinical Medicine and Physician to King's College  
Hospital.

GENTLEMEN,—This being my first lecture as special Professor of Clinical Medicine, I wish to state very briefly my reason for having resigned the chair of Medicine which I have held for the last thirteen years. For some time past, but especially during the last two years, the increase of my professional engagements has rendered it very difficult for me to give my lectures on the Principles and Practice of Medicine with the requisite regularity. I therefore felt it to be my duty, both to you and to the Council of the College, to resign my professorship.

The Council in accepting my resignation have elected me, as I am informed, by a unanimous resolution to be Professor of Clinical Medicine, with the same appointment at the hospital as I before held.

Now let me say that one result of my reluctant resignation of the Professorship of Medicine will be that I shall have more time to devote to the important subject of clinical teaching, and that I shall soon be enabled to act upon a suggestion which has often been made to be by some of my past and present pupils, to publish in a collected form those of my lectures on the Principles and Practice of Medicine which I look upon as most likely to be of service to you and to other students of medicine.

One more remark and I have done with these personal explanations. I have often been asked why I resigned the office of Examiner in Medicine to which the Council of the Royal College of Surgeons of England lately did me the honor to appoint me. The explanation is very simple. I am in the midst of my year of office as Senior Censor

of the Royal College of Physicians, and most of the examinations being held simultaneously at the two Colleges, I found it impossible to discharge at the same time the duties of Censor at the College of Physicians and Examiner at the College of Surgeons. I therefore had no alternative but to resign the office to which I had been last appointed.

Now let me direct your attention to some matters of more than ordinary clinical interest and importance.

Most of you here will remember that in my lectures on the Principles and Practice of Medicine I have been in the habit of teaching that the friction-sound of pericarditis is, in most instances, not merely to-and-fro—systolic and diastolic—but that a third sound often intervenes somewhere between the other two. I say “somewhere” because until quite recently I did not know at what period of the heart's revolution the third friction-sound occurred. During the last few months I have gradually worked out what I believe to be the true interpretation of the triple pericardial friction-sound, and I purpose now to explain to you the successive steps by which I have arrived at this result.

I got the first hint towards a solution of the problem from a very interesting and suggestive clinical lecture published by the late Dr. Hyde Salter.\* In that lecture Dr. Salter describes first a case of rheumatic pericarditis, in which a friction-sound double over mid-sternum became triple over the right third intercostal space close to the sternum, and as this triple character of the friction-sound was most marked when the stethoscope was placed directly over the right auricle, Dr. Salter said: “I feel no doubt that the third element of the sound, on passing from the surface of the ventricle to that of the auricle, is due to auricular pericardial friction.”

Dr. Salter next relates a case of renal pericarditis in which a single friction-sound of distinctly presystolic rhythm was heard over the third costal cartilage about an inch to the left of the sternum, and the patient dying a few days afterwards, the left auricle was found covered and roughened with lymph. “The roughening was confined to the surface of the auricle, and therefore,” Dr. Salter remarks, “the friction-sound coincided with the movements of the auricle.”

\* THE LANCET, 1871.

In a third case, which was also one of uræmic pericarditis, Dr. Salter heard a to-and-fro friction-sound over a spot not larger than a shilling in the intercostal space, close to the right edge of the sternum. The first and louder sound was presystolic, the second systolic in rhythm; and, as the diastole of the auricle coincided in time with the systole of the ventricle, Dr. Salter inferred that this double sound, limited to the region of the right auricle, was caused by the systole and diastole of an auricle roughened by lymph. A day or two after the occurrence of the auricular friction the sound spread down over the ventricles, and became general, and a day or two after that the patient died. At the post-mortem examination the pericardium was found to be the seat of recent general inflammation, and was everywhere roughened with soft lymph. Lastly, Dr. Salter refers briefly to a case in which a circumscribed friction-sound was heard over the third right interspace close to the sternum; the sound was to-and-fro, and the first and loudest of its two elements was sharply presystolic in time.

Not long after the publication of Dr. Salter's lecture, the following case came under my own observation.

John E—, aged fifty-five, was admitted into Craven ward on October 27th, 1873. He had been a wine porter at the London Docks; he had drunk freely, and at the time of his admission he was suffering from the symptoms of contracted granular kidney in an advanced stage. At my visit soon after his admission I noted that a presystolic exocardial friction-sound was heard most distinctly between the left nipple and the sternum, and as it was obviously synchronous with the auricular systole, I remarked that in all probability the sound was caused by the friction of one auricle having its surface roughened by lymph. On the 30th of October, in addition to the presystolic sound before noted, there was a systolic friction-sound heard most distinctly at the heart's apex, slightly to the left of the mammary line. I then expressed my belief that, in addition to the roughening of the auricle by lymph, there was probably a patch of lymph near the apex of the ventricle. On the 6th of November the presystolic friction at the base had ceased to be audible, while the systolic sound at the apex was still heard. On the 1st of December the systolic friction was still heard at the apex, but on Dec. 8th it had become less distinct, and an endocardial systolic blowing-sound was heard at the apex. At subsequent visits it was noted that the systolic sound at the apex had lost its friction character, and assumed the character of a regurgitant mitral murmur. This continued until the patient's death on Jan. 3rd. We found, as I had anticipated, that the right auricle and the apex of the right and left ventricle were covered each by a patch of lymph, the surface of which having become smoothed down by friction accounted for the cessation of the friction-sounds which had been present when the surfaces were roughened by recent exudation. The margins of the mitral valve were thickened by lymph, and thus the regurgitant mitral murmur was explained.

And now, having learnt, not only by the study of Dr. Salter's recorded cases, but by the observation of this one case under my own care, that an auricle roughened by lymph may cause a friction-sound of presystolic rhythm, I soon saw that in this sonorous influence of the contracting auricle

was to be found the interpretation of the triple friction-sound of pericarditis, with which I had long been familiar as a clinical fact, although I had not hitherto been able to explain it.

Dr. Salter, in his concluding remarks, says: "Triple friction, as far as I know, is a new thing, or rather, I should say, an undescribed thing, for no doubt it is as old as pericarditis itself." This remark is not quite correct, for Dr. Stokes refers to a case of pericarditis in which he observed a triple friction-sound.\* But although Dr. Salter was not the first to describe a triple pericardial friction-sound, he was, so far as I know, the first to explain it. He evidently, however, looked upon the triple sound as a rare and exceptional phenomenon, whereas it is, in fact, the usual result and indication of pericarditis affecting the general surface of the heart.

During the past winter session I have had under my care in the hospital seven cases of acute pericarditis, four rheumatic, two uræmic, and one the result of exposure to cold; and in four out of these seven cases most of you had the opportunity of observing that when the disease was at its height a triple friction-sound was distinctly audible over the heart, the triple character of the sound being most distinct near the base of the heart at the junction of the auricles and ventricles. In the two uræmic cases, there being advanced granular contraction of the kidney, the disease was fatal, and the whole surface of both auricles and ventricles was found roughened by recent lymph. In the three cases with a friction-sound not triple, but only to-and-fro, the disease assumed a milder character, having apparently been cut short by the early application of leeches. I have said that the friction-sound resulting from a severe and general pericarditis is triple—*rub-a-rub*,—reminding one, as Dr. Salter says, of the triple sound of a canter. The first two divisions of the triple sound occur in quick succession, the third after a rather longer interval; then follows a pause, and again occurs the *rub-a-rub*. Now, if while you are listening to this triple sound you place your finger over the heart's apex or over one carotid, and at the same time bear in mind what you may have seen of the rhythmical contractions of the exposed heart of a living or recently dead animal, you will readily perceive that the first element of the triple sound is auricular systolic, the second ventricular systolic, and the third ventricular diastolic, while the silent interval which follows coincides in time with the post-diastolic pause. The relation of the triple sound with the heart's movements and rhythm may be represented as follows:—

|     |                      |
|-----|----------------------|
| Rub | Auricular systole    |
| a   | Ventricular systole  |
| Rub | Ventricular diastole |
| Rub | Auricular systole    |
| a   | Ventricular systole  |
| Rub | Ventricular diastole |

A to-and-fro friction-sound might be caused by lymph on the surface of one auricle alone, as happened probably in Dr. Salter's third and fourth cases. When both the auricle and the ventricle

\* Diseases of the Heart and Aorta, pp. 29-30.

are roughened, the second auricular friction-sound (auricular diastolic) would of course be blended with the ventricular systolic, the diastole of the auricle and the systole of the ventricle being coincident. A friction-sound at the commencement of pericarditis is usually single and systolic, but it may quickly become double and triple. On the other hand, when the disease is subsiding, the first sound to cease is usually the auricular systolic, then the ventricular diastolic. A single systolic brush may remain for many days, and even for weeks, after the active symptoms have passed away.

The cessation of the friction-sounds after an attack of acute pericarditis is due, in a large proportion of cases, not to adhesion of the two layers of pericardium, but to the smoothing down and polishing of the previously roughened surface of the serous membrane. So long as the pericardial surface is roughened, the first sound may be associated with a sound of a superficial brushing character, which an inexperienced or careless auscultator may readily mistake for an endocardial mitral murmur. The diagnosis may be aided by observing that the exocardial sound is often much increased, and sometimes made to-and-fro, by making firm pressure with the stethoscope over the spot where it is most distinctly heard. The exocardial sound, too, is often heard most distinctly, not at the apex, where a regurgitant mitral murmur is most audible, but some distance above the apex over the body of the ventricle, and it is rarely heard at the back of the chest.

I now proceed to the consideration of another interesting phenomenon of cardiac auscultation to which attention has been of late especially directed—I mean the so-called *reduplication of the first sound*, which is often associated with Bright's disease, both acute and chronic, and which is also heard in connexion with other morbid states to which I shall presently refer. Dr. Sibson has devoted much time and labor to the investigation of the reduplication of the first sound in connexion with Bright's disease. In many cases of Bright's disease it is admitted by all pathologists who have given their attention to the subject, that there is an increase of systemic arterial tension consequent on the impeded passage of the impure blood through the terminal vessels. The contraction of the muscular arterioles throughout the systemic circulation is, without doubt, the cause of this impediment and of the resulting arterial tension, and the doubling of the first sound is in some direct way associated with the increased arterial tension. Dr. Sibson explains the reduplicate first sound by saying that the left ventricle, owing to the resistance offered by the tight arteries to the expulsion of its contents, continues its contraction later than the right, which has expelled its blood into the pulmonary artery with comparative ease. The shock of the first sound is heard at the end of the contraction of the ventricle. Hence, in consequence of the left ventricle contracting more tardily than the right, there is a doubling of the first sound.\* Dr. Sibson admits that there is a difficulty in reconciling this explanation of the double first sound with the absence of doubling of the second sound in the same cases, and he meets the difficulty with the following statement:—"In these cases the systemic arteries are always in a state of great tension.

When the blood ceases to be sent into the tight aorta, the instant contraction of the walls of the arteries sends the blood back upon the aortic walls and valve. The pulmonary arteries at the commencement of the systole are comparatively flaccid, but become tense at the end of it. The walls of the pulmonary artery begin to contract and send back a return wave upon the trunk of the artery; but as these walls are not always in a state of tension they take a longer time to contract than those of the aorta and its branches. Owing, therefore, to the slowness of the pulmonary, and the quickness of the aortic, contraction, the latter, which is already heavily handicapped, makes up in speed what it loses in time, and the two systems of arteries deliver their backstroke at the same instant." Now, it appears to me that this explanation, while it apparently removes one difficulty, raises another of a very formidable character. If the greater tension of the aorta in the cases under consideration enables it to overtake the earlier but less forcibly contracting pulmonary artery, then it is obvious that in the normal condition, the aorta and the pulmonary artery commencing their contractions at the same instant, the much greater tension of the aorta should react upon and close its valves before those of the more feebly contracting pulmonary artery are closed, and the result should be reduplication of the second sound as a constant and normal condition.

Again, I have in numberless instances demonstrated to you in the wards an analogous doubling of the first sound in cases of advanced general emphysema of the lung, with resulting fulness and hypertrophy of the right ventricle. Here the increased tension of the pulmonary artery consequent on the impeded circulation through the lungs can rarely, if ever, equal the normal tension of the aorta. If then, in accordance with Dr. Sibson's theory, the right ventricle completes its contraction later than the left, and so causes the reduplication of the first sound, the closure of the pulmonary valves must inevitably be effected later than that of the aortic valves, and the second sound would also be doubled. The reverse, however, is the case. The second sound, although accentuated over the pulmonary valves, remains single, while the first is distinctly reduplicated. A want of synchronism in either the commencement or the completion of the ventricular contraction must, in my opinion, be a very rare phenomenon. The interlacing of the muscular fibres of the two ventricles, their passing over from one side to the other, appears to render the synchronous contraction of the ventricles a physical necessity; and in watching the exposed heart of an animal in the different stages of apnoea, first in the stage of systemic obstruction with distension of the left cavities, and later during the period of pulmonary obstruction, with great distension of the right cavities and comparative emptiness of the left, I have been struck by the uninterrupted exact synchronism of the contractions on the two sides. A consideration of these difficulties in the way of accepting Dr. Sibson's theory of reduplication of the first sound in association with Bright's disease led me to seek for another explanation of the phenomena, and I now venture to suggest that the true explanation is to be found in the fact that the *contraction of a dilated, and especially of an hypertrophied, auricle becomes sonorous, and that the*

\* Lumleian Lectures, THE LANCET, 1874.

*first division of the double first sound in the cases under consideration is the result of the auricular systole.*

I believe that this explanation of reduplication of the first sound will be found consistent with all the ascertained facts. In the first place, it will be observed that the rhythm of the sound in cases of well-marked reduplication is precisely the same as that of the triple friction-sound before referred to as a result of pericarditis. The triple friction-sound being expressed by *rub-a-rub*, the triple sounds in a case of reduplication may be represented by *rat-a-tat*. The cantering character of the sounds may be imitated by bringing down sharply upon the table in quick succession the ends of three flexed fingers, making the two first taps nearer together than the second and third. The triple friction-sounds are longer and more nearly continuous with each other, but the rhythm is precisely the same in the two classes of cases. The relation of the triple sound to the heart's movements may be represented as follows:—

|     |                      |
|-----|----------------------|
| Rat | Auricular systole    |
| a   | Ventricular systole  |
|     |                      |
| Tat | Ventricular diastole |
|     |                      |
| Rat | Auricular systole    |
| a   | Ventricular systole  |
|     |                      |
| Tat | Ventricular diastole |

The reduplication of the first sound in cases of Bright's disease is usually most distinctly heard between the mamma and the sternum in the third left interspace—that is, about the line of junction between the auricle and ventricle. The sound may be single or indistinctly double at the apex, while it is decidedly double at the third interspace, and again single over the aorta. The position in which I have stated that the reduplication is best heard accords with Dr. Sibson's account, but our explanations differ essentially. He states that in this position the supposed asynchronous contraction of the two ventricles is heard, while I believe that the contraction of the dilated, tense, and often hypertrophied auricle is there heard immediately before that of the ventricular systole. That the reduplicate first sound is often inaudible at the apex of the heart, where the normal first sound is best heard, is in itself suggestive that some other agency than ventricular contraction is concerned in the causation of the phenomenon. The assumed asynchronism of the ventricular contraction is a theory unsupported by evidence, but the rapidly successive contraction of the auricle and ventricle is an undoubted fact. The question then arises, Does the contraction of the auricle afford a satisfactory explanation of the first element in the reduplicate first sound? It is of course admitted that in the normal state the contraction of the auricle, contrary to Laennec's original theory of the heart's sounds, is inaudible; but we have positive evidence of sound resulting from the auricular systole in two distinct morbid conditions. First, as a result of constriction of the mitral orifice, we have the now well-known presystolic or, as Dr. Gairdner happily designates it, the auricular systolic murmur. In these cases the impediment resulting from the mitral constriction causes a slow auricular contraction with a prolonged presystolic murmur, followed

by a short first sound, the result of rapid contraction of the partially filled left ventricle. Second, when the surface of the auricle is roughened by lymph there occurs the presystolic, or, better, the auricular systolic friction-sound. Then, as a result of obstruction in the systemic arteries, and consequent distension of the left auricle, either with or without hypertrophy of its walls, we have, as I believe, an audible auricular systole, constituting the first division of the reduplicate first sound in cases of Bright's disease. The rhythm of this auricular systolic sound is precisely the same as that of the auricular systolic mitral murmur and of the auricular systolic pericardial friction-sound; and this identity of rhythm in the three classes of cases affords to my mind one of the strongest proofs that the first sound in each case is excited by the auricular systole. The triple friction-sound of pericarditis and the triple sound resulting from the doubling of the first sound are alike suggestive of a canter.

In one of my cases of rheumatic pericarditis before mentioned, the friction-sound, which had been distinctly triple, assumed for a time the character of a reduplicate first sound. At the stage to which I refer there was a single systolic brush over the ventricle near the mamma, while over the mid-sternum there was a short presystolic brush, which, being quickly followed by the first sound, bore a close resemblance to a reduplicate first sound. The presystolic brush was probably caused by the systole of the right auricle still slightly roughened with lymph. In a few days more the pre-systolic sound had ceased, and there remained only the systolic brush over the body of the ventricle.

As I have before remarked, it is sometimes difficult to distinguish the sort of prolongation of the first sound, which is caused by a patch of lymph near the apex of the heart, from a regurgitant mitral murmur. I believe, too, that the forcible friction of an hypertrophied left ventricle in cases of chronic Bright's disease frequently causes an uneven thickening of the pericardium over a circumscribed space (a white spot on the pericardium—a pericardial "corn"), which gives a prolonged and brushing character to the first sound, sometimes not easily distinguishable from a systolic mitral murmur. I have several times diagnosed such a white patch during life, and have found it after death, as some of you here can testify.

I have before stated that the reduplication of the first sound occurs not only in connexion with Bright's disease, but it is almost constantly associated with advanced general emphysema of the lung. I have observed it frequently in elderly persons with degeneration and rigidity of the arterial walls; also very distinctly above and to the right of the left nipple in some cases of mitral regurgitation. There is a good example of this in the case of a girl now in Twining ward. There is one feature which is common to all these cases, and that is an impeded circulation, either pulmonary or systemic. The result of this obstruction acting backwards is to cause distension and by degrees hypertrophy of the walls of one or both auricles. It is obvious that an impediment commencing in the systemic arteries or at the left side of the heart, may by a retrograde action extend through the lungs to the right cavities of the heart.

In some cases of coexisting emphysema of the lungs and chronic Bright's disease both sides of the heart become simultaneously hypertrophied, and

the reduplication of the first sound is distinctly heard over an extensive surface. I have quite recently, in private practice, seen several examples of this complication. It is obvious that the theory of asynchronous ventricular contraction is inadequate to the explanation of the reduplication which results from a simultaneous equal, or nearly equal, impediment in the pulmonary and systemic vessels; while the auricular theory explains the phenomena completely.

I have observed distinct reduplication of the first sound over the base of the heart in some cases of simple dilatation of the heart's cavities, without valvular disease or evidence of arterial obstruction, either pulmonary or systemic. Here, again, the facts are inconsistent with the theory of asynchronous ventricular contraction.

That the systole of a distended and hypertrophied auricle may generate sound is in the highest degree probable. There are three influences which, either separately or combined, may cause an audible sound during the auricular systole: First, the sudden muscular tension of the walls of the auricle; secondly, the impulse against the chest wall; and, thirdly, the forcible impact of the blood driven onwards by the auricle against the stationary blood within the ventricle. This last element is similar to that which, according to the theory of Dr. Leared, is the main cause of the normal first sound of the heart—namely, the forcible impact of the blood from the ventricles against the stationary columns of blood in the aorta and pulmonary artery. Of this theory of Dr. Leared, Dr. Walshe says that "it appears more in accordance with the principles of physics, and better reconcilable with numerous facts of clinical experience, than any of its rivals."\*

Dr. Charcelay, of Tours, has published a case (*Archives Générales de Médecine*, December, 1838, pp. 406-8) in which a presystolic knocking (*claquement*), heard beneath the right edge of the sternum on a level with the second rib, was found after death to have been caused by an aneurismal dilatation, with thickening of the right auricle; and Dr. Walshe states that "in a case of hypertrophy of the left auricle, a loud presystolic sound of maximum force at the third left cartilage, different absolutely from a reduplicate sound by its special knocking character."† Since, then, an aneurismal and a much hypertrophied auricle have been known to cause a knocking sound of presystolic rhythm, it is in the highest degree probable that an auricle in an intermediate state of dilatation and hypertrophy would generate exactly that amount and kind of sound which we recognise as the first division of the duplex first sound.

I have endeavored to ascertain whether, by the position in which the double sound is best heard, it is possible to determine which of the two auricles is the cause of the first division of the sound in any given case.

Without doubt, if the auricle is roughened by lymph, the resulting friction-sound will be best heard over the third interspace, to the right or left of the sternum as the right or left auricle is the one affected. I find, too, that in cases of emphysema, with impeded pulmonary circulation, the reduplication is more distinctly heard at the right margin and the lower end of the sternum than to the left; while in cases of renal disease, and cases

of senile degeneration of the systemic arterial walls, the sound is best heard between the mamma and the left margin of the sternum—that is, over the space where a distended left auricle would overlap the ventricle. I believe, however, that in consequence of the oblique position of the heart, and the over-lapping of the left cavities by the right, the sound which results from contraction of the left auricle, and especially the sound which may be supposed to result from the impact of the blood from the contracting auricle against that contained in the dilated ventricle, will be more or less diffused over the overlapping right ventricle. The left auricular sound therefore is with more difficulty localised and distinguished from the right than the aortic from the pulmonary share of the normal second sound, each of which, as we know, is conducted along the course of the artery in which it originates. It is probable, too, that in consequence of the closer approximation of the right cavities to the chest wall, the amount of obstruction in the pulmonary vessels, which will render the right auricular contraction audible with resulting reduplication of the first sound, is less than the degree of systemic obstruction required to develop the same phenomena on the left side.

In addition to the evidence already adduced in favor of the auriculo-ventricular theory of the double first sound, the following facts appear to me to be of importance:—

1. The doubling of the sound is always more distinctly audible over the body of the heart than at the apex. The reduplication is either lost or indistinctly heard at the apex. Now, since the normal first sound is always best heard at the apex, we should expect to find that if both elements of the double sound were the result of ventricular contraction the double sound would be most distinct also at the apex.

2. The part of the double sound which is lost as we pass from base to apex is always the first or presystolic part. Now in cases of Bright's disease, with obstruction in the systemic arteries, the advocates of the theory of asynchronous contraction of the ventricles might argue that when the stethoscope is placed over the apex of the heart which is formed by the left ventricle, the comparatively feeble sound which results from the earlier contraction of the right ventricle becomes inaudible, and only the single sound of the left ventricle reaches the ear. But, unfortunately for this argument, when, in consequence of emphysema with pulmonary obstruction, the first sound is double near the base of the heart and single at the left apex, it is still the *first* division of the double sound which disappears at the apex; yet if the want of synchronism of the ventricular systole were the cause of the phenomena, the absent sound would be that of the earlier contracting left ventricle over whose apex the stethoscope is applied. The facts, then, are irreconcilable with the theory which assumes that the doubling of the first sound is due to a retarded contraction of one or other ventricle. You will readily understand that the distinctness of the reduplication is much influenced by the rapidity of the heart's action. The first sound, which is distinctly double when the heart's action is slow, may lose the reduplication when, in consequence of increased rapidity of the heart's contraction, the sounds of the auricular and the ventricular systole become blended together into one sound, which may then have a somewhat

\* Diseases of the Heart, 4th Edit., p. 57. † Ibid., p. 75.

prolonged and brushing character, such as an inexperienced and unskilful auscultator might mistake for the murmur of valvular disease.

Dr. Hayden, in his recently published elaborate and valuable work "On Diseases of the Heart and Aorta," expresses the opinion that reduplication of the first sound "is due to resolution of the first sound into its two normal elements—namely, the cardiac impulse, and the sudden tension of the auriculo-ventricular valves." He believes that "cardiac impulse coincides with the initial portion of the ventricular systole, whilst tension of the auriculo-ventricular valves and attached chordæ tendinæ occurs at the conclusion or acme of the systole." Under ordinary circumstances the two elements are virtually simultaneous, not so, he thinks, when the contraction of an hypertrophied ventricle is retarded. In that case the initial portion of the first sound is dull, because due to the stroke of the apex only; whilst the concluding portion is sharp and clear because no longer masked by the dull element of impulse (p. 164). I am bound to say that this description of the relative dullness and clearness of the two elements of the reduplicate first sound does not accord with my experience; and the fact that, as a rule, the reduplication of the first sound is most distinctly heard some way above the heart's apex appears to be inconsistent with Dr. Hayden's theory. It is scarcely necessary to remark that all the evidence which I have adduced in support of my own explanation of the phenomena of reduplication is *pro tanto* adverse to the acceptance of any other theory.

Some of you may perhaps be inclined to ask whether any practical gain is to be expected from the minute observation and analysis of the heart's sounds upon which I have been dwelling in this lecture. In reply to such an inquiry I would remark, first, that the careful study of physical signs is a very wholesome educational discipline for the student and practitioner of medicine. All observations of natural phenomena, to be of value either for the extension of scientific knowledge or for practical guidance, must be precise and accurate. No one familiar with the subject would question the proposition that the study of physical signs has served not only to correct many erroneous notions which had long prevailed with regard to the general or functional symptoms of pulmonary and cardiac diseases, but that it has also much facilitated and improved the treatment of many of those maladies. Then just in proportion to the confidence with which you have learnt to rely upon physical signs in aid of diagnosis and prognosis is the necessity for accuracy of observation and interpretation. If you mistake the soft systolic murmur of anemia for organic obstruction at the aortic orifice, you not only are wrong in your diagnosis but you base upon that error an unfavorable prognosis, and perhaps neglect to adopt the chalybeate and restorative treatment which would at once remove the anemia and the murmur to which it gave rise. Again, if you mistake a presystolic friction-sound for the presystolic murmur of mitral stenosis, or a systolic friction-sound for the murmur of mitral incompetence, you confound what may be only a transient and harmless roughening of the surface of the pericardium with the most formidable of the organic valvular lesions; and you cause an incalculable amount of alarm and anxiety by a prognosis deduced from an errone-

ous observation. I scarcely need remind you that the only way to avoid these errors of observation and interpretation is by constant and careful clinical study to increase and perfect your diagnostic skill.

The reduplication of the first sound, upon the interpretation of which I have dwelt so long, is not without its practical prognostic significance and value, in so far as it affords undoubted evidence that the impediment to the circulation, whether in the pulmonary or in the systemic system, is acting backwards through the ventricle upon its associated auricle, and is causing some degree of auricular dilatation and hypertrophy; and, on the other hand, the cessation of the reduplication, as, for instance, in some cases of acute and transient Bright's disease, is evidence of the returning freedom of the circulation, and so far it is of favorable omen. That the contraction of the terminal muscular arterioles excited by blood contamination, the results of renal disease, should act backwards through the systemic arteries upon the left ventricle and auricle so as to cause an appreciable modification of the heart's sounds, and ultimately hypertrophy of the muscular tissue of the propelling heart and of the resisting and regulating arterioles, is an interesting illustration of the correlation of physiological forces. And you will find hereafter, in the daily practice of your profession, that your ability to observe and to interpret some of the more obscure and doubtful phenomena of disease is much favored by the study which you have bestowed upon minute physical signs such as those which we have now been discussing.

*Postscript.*—After the preceding lecture had been written, and a few days before it was delivered, my friend and colleague Dr. Cunnow directed my attention to a recently-published thesis, entitled "D'un Phénomène Stéthoscopique propre à certaines formes d'Hypertrophie simple du Cœur," by Dr. Exchaquet, Interne des Hôpitaux de Paris, 1875. In this publication the author gives the results of observations made in numerous cases by his teacher, M. Potain. These observations have reference to the modification of the heart's sound which Dr. Sibson and others call reduplication of the first sound, but which the French observers designate "bruit de galop." It should be borne in mind that "petit galop" is the French equivalent for the English word "canter." Dr. Exchaquet raises various forcible objections to Dr. Sibson's theory of reduplication, and maintains that the presystolic element of the double first sound is caused by an *abnormally energetic and sudden contraction of the left auricle*. I have been much interested to find that my explanation of the phenomena of reduplication, arrived at quite independently, has been anticipated and confirmed by M. Potain, who points out that when the chest is not thickly covered by fat the presystolic contraction of the auricle may be seen and felt in the third left intercostal space, where in the same cases the bruit de galop is also most distinctly heard. I find, however, that M. Potain looks upon this modification of the heart's sounds as being almost invariably associated with certain forms of albuminuria. As an exaggeration of a normal phenomenon he has observed it to a very slight degree, and as a transient condition, in persons free from organic disease and from functional disorder of any kind; but when the bruit de galop is pronounced and permanent, he believes it to be invariably asso-

ciated with albuminuria and resulting distension of the left auricle, and he looks upon this acoustic sign as diagnostic of certain forms of albuminuria. One of Dr. Exchaquet's "conclusions" is: "La présence de l'albumine dans l'urine est constamment observée chez les malades qui présentent ce signe"—i.e., the bruit de galop. The author makes no reference to the very frequent association of the bruit de galop, *alias* doubling of the first sound, with emphysema and other conditions resulting in an impeded circulation through the lungs, and consequent distension of the right auricle, but unassociated with albuminuria—a class of cases of very common occurrence to which I have directed attention in my lecture. Dr. Exchaquet discusses the theoretical explanation of the impeded circulation, and the resulting cardiac hypertrophy in cases of Bright's disease, and I have been as much amused as amazed to find him asserting that I adopt and defend Traube's theory, which attributes the cardiac hypertrophy solely to the impeded circulation through the *kidney*. I had supposed myself to have been amongst the first to point out the insufficiency of Traube's theory, and to suggest an explanation of the phenomena more in accordance with anatomical facts and with physiological principles. If Dr. Exchaquet will do me the favor to refer to my little volume of "Lectures on Bright's Disease," he will find that my explanation of the relation between cardiac hypertrophy and Bright's disease, whether true or not, is, at any rate, essentially different from that given by Traube.

## Address

ON

### APPLIANCES USED IN BIOLOGICAL INVESTIGATION.

*Delivered at the opening of the Biological Conferences in connexion with the Loan Exhibition of Scientific Instruments, South Kensington.*

By J. BURDON SANDERSON, M.D., LL.D., F.R.S.,

Chairman.

It having been made part of the duty of the chairman of each section of this exhibition to deliver an opening address, it became necessary for me to select a subject. I have had little difficulty in doing this. I propose to attempt to give you an account of some of the instruments of research which you have already seen in the adjoining room, selecting for description and illustration those which are of the simplest construction, and at the same time serve to exemplify the most important and generally employed methods of investigation. In attempting to carry out this intention my scope will be far from ambitious. In addressing you I will take it for granted, for the moment, that none of the distinguished physiologists whom I see before me are present, and will make it my aim to explain to those who have no special knowledge of that branch of natural science which

deals with the phenomena of the *life* of plants and animals, and which we therefore call biology, some of the appliances which are of the greatest value in the study of those phenomena.

You are aware that the Committee, in order to render these conferences as useful as possible, have thought it desirable that we should devote our attention chiefly to those subjects of which the instruments contributed afford the fullest illustrations. These subjects are: first, the methods of measuring and registering the movements and other vital phenomena of plants and animals; secondly, the methods of investigating the eye as an optical instrument; and, thirdly, the methods of preparing the tissues of plants and animals for microscopical examination.

Of these several subjects it is proposed that we should concern ourselves to-day chiefly with the first. I shall, therefore, occupy your attention with an account of some of the simplest methods of physiological measurement, and particularly of the methods of measuring the time occupied in the phenomena of life, in the hope that what I tell you may serve as an introduction to the more complicated descriptions which will be given by Professor Donders, M. Marey, and other eminent men, of the elaborate and beautiful instruments which they have contributed to the collection.

I will commence by making the statement, which may perhaps seem to some persons strange, that the study of plant and animal life is entirely an affair of measurement. I will endeavor to offer to you grounds for thinking that it is so, and must be so.

To begin with, it is the character of the scientific study of nature, as contrasted with that vague contemplation of natural objects which many persons imagine to be the business of the naturalist, that it consists in bringing the unknown into relation with the known. Whatever may be the object of our study, whether it be a country, a race, a language, a plant, or an animal, the process by which we come to know it is throughout a process of comparison—a process in which we compare the object of study in respect of such of its features as interest us, with some known standard. And the completeness of our knowledge is to be judged of, first, by the certainty of the standard which has been assumed by us to be true, and, secondly, by the accuracy of our method of comparison and the care used by us in applying it.

Now "comparison with a standard" is only another expression for "measurement"; and in biological research, I repeat, accurate comparison with standards is quite as essential to the value of results as it is in physics or chemistry. Those who have attended the conferences relating to these subjects have learnt how much of the work of the physical investigator is of this nature. From his, our work differs only in this respect, that we do not, as he does, seek out and determine the value of our own standards, but accept as such those well ascertained certainties of nature which he has already measured out for us. In many cases we do not even concern ourselves in knowing how our standards are obtained, being content to know that they have received the stamp of acceptance in the more exact sciences on which we are constantly dependent for guidance.

I will now endeavor to illustrate my proposition by examples:—

The first objects which strike the eye on enter-



ing the room are the large collection of microscopes. You will say, Surely the microscope cannot be regarded as an instrument of measurement. I answer, In so far as it is an instrument of research, and not a mere pastime, it is so. All real microscopical work is matter of measurement. Let us take as an example one of the simplest and best known of microscopical objects—a colored blood-disc. What I see is a mere circular outline. But I know that that outline represents a lenticular disc of transparent elastic material. All that these words convey has been learnt by methods of measurement. Proceeding from its form to its attributes, I can, by a still more direct application of the method, determine from the microscopical examination of the smallest quantity of blood, even of a drop, the proportion of blood-corpuscles, and consequently, by approximation, the percentage of hemoglobin and of iron which it contains. As this is a recently discovered method, and one which possesses great practical value in its applicability to medicine, and can be illustrated by showing you the instruments, I will refer to it as my first example. I think I may take it for granted that everyone present is aware that blood is a fluid mass in which solid particles—the corpuscles already mentioned—are suspended. These corpuscles exist in such enormous numbers that in a cubic millimetre (i.e., in the bulk of a pin-head) there are about five millions of them. Even those who are not physiologists will readily understand that it is a matter of the greatest importance to determine in what proportion these little particles exist in human blood at any given time. It is of importance not merely to the physiologist, who knows that the corpuscles are the agents by which oxygen is conveyed from the external air to the living protoplasm out of which our tissues are built up, but still more to the pathologist, who, in a number of cases, recognises in the destruction of these colored discs one of the most serious results to ordinary health. How can it be known, in any individual case, whether the number of colored discs circulating in the bloodstream is below or above the normal standard? The essence of the method consists in mixing a measured (but very minute) quantity of blood to be investigated with a much larger quantity (250 times its bulk) of another liquid which is without action on the blood-corpuscles, and introducing a layer of the mixture between two horizontal and parallel plates of glass which are at a measured distance from each other. If now a cube, measuring a fifth of a millimeter, is, so to speak, cut out of the stratum, it is evident that it will correspond to about a thirty-thousandth of a cubic millimeter. Consequently, if a census is taken of the number of corpuscles such a cube contains, it would amount to 166. Now, though, at first sight, it might seem impossible to make such an enumeration, it can in practice be carried out with more than sufficient accuracy, especially if the mean result of several countings is taken.

Let me now leave the microscopes and microscopical apparatus, of which the excellences will be fully explained to you by others, and draw your attention to other instruments. You will find, if you look through the room or through the catalogue, that they are all more or less instruments of measurement. Thus, we have instruments for determining the weight or bulk of the animal body or of its parts, others for measuring growth—par-

ticularly the growth of plants, others for measuring the various results of muscular action, and others for investigating the electrical phenomena of plant and animal life.

Numerous as are the forms of apparatus of which we have here examples, they are but few as compared with the number which must be actually used by the biologist, for those only are here represented which are specially biological. For many purposes the biologist has recourse to the methods, and consequently to the tools, which are to be found ready to his hand in the physical and chemical laboratory. We use, for example, the balances, the galvanometers, the polariscopes, with which the physicist provides us, and do not call them biological instruments, although we biologists are constantly using them. The only instruments which we can thus designate are those which have been either entirely devised for physiological purposes, or have been so modified for such purposes as to be in some sort new instruments. I would take, as an instance of this, the kymograph of Prof. Fick. It is essentially a Bourdon's manometer, to which such a form has been given as to adapt it, not for its more usual purpose—that of a steam-gauge—but for the measurement and registration of the fine variations of the pressure of the blood against the internal surface of the arteries. Many other examples might be given of the same kind, so that if we were to transfer from the biological department every instrument in respect of which it could be shown that it was identical in principle with some instrument ordinarily employed in physical research, we should have very little indeed to show you.

Even if it were possible within the limits of a short address to give you an account of the various instruments of measurement contained in the collection, it would be far from desirable; for many of them will be explained to you, as I have already said, by those to whose ingenuity and scientific knowledge they owe their existence. I shall therefore confine myself to the description of one or two familiar and well-known methods, which I shall select rather because they can be easily explained, and because they admit of some degree of experimental illustration; and with this view will endeavor to exhibit to you their applicability to phenomena which relate to the human body, and not merely to those observed in plants or animals. There are two sorts of measurement so applicable, and which I can readily exemplify—namely, measurement of time and measurement of volume, or rather of changes of volume, both of which yield results of importance and interest.

The simplest of all cases of nervous action is that in which a muscle is thrown into contraction when influenced by a change having its seat in a distant part—i.e., in one of the central organs of the nervous system—in a motor centre, this motor centre being awakened to activity by an impression received by it from outside. This process, which is called reflex action, and has been recognised by physiologists, from a very early period, as a characteristic of animal life, may evidently, if we place before our minds what occurs in the centre itself, be described as consisting of three successive stages. Of these, the first is fitly designated that of excitation—wakening, and the third that of discharge; while, during the intervening period, the condition of the centre may be regarded as one of preparation for action, for, having been acted on by

the stimulus, it is, as it were, preparing to discharge itself.

The point that I wish to be borne in mind is that each of these stages occupies time, and that in each instance this time admits of measurement, so that of a number of nervous processes, all of which appear to our unaided appreciation instantaneous—"as quick as thought"—some are found, when submitted to the test of measurement, to differ very remarkably from others. Thus, for example, if we confine our attention for the moment to the simplest reflexes, we shall find that, whereas the time occupied in the transmission of the wakening influence from the surface of the body to the centre is exceedingly short, and that occupied in its discharge from the centre to the muscle is also exceedingly short, that during which the centre is occupied, so to speak, in preparing itself for action is of *relatively* long duration, although to us it appears instantaneous.

The simplest measurement is that of the third stage in the process, that of the conveyance of the discharge from the centre to the muscle. This measurement may be accomplished with the greatest exactitude in the motor nerves of those animals in which the vital properties are retained for long after death, and particularly in those of the frog. You will find several forms of apparatus in the collection specially adapted for this purpose. As, however, I propose to-day to give instances in which the human body only is used, I will not describe these instruments, all of which are included under the term "myograph."

In man the rate at which a message is transmitted along a nerve has been determined by Helmholtz as 110 feet per second. The way in which we can arrive at the result is easily explained. If you place the half-closed hand, with its ulnar side resting on the table, and the thumb supported on a horizontal lever above it, it is evident that if, by voluntary effort or otherwise, a contraction of the muscle is determined, by which the thumb is brought towards the index-finger, the moment at which that takes place will be indicated by the descent of the lever. Normally this contraction occurs only when it is determined by the will, or in consequence of the excitation of some subordinate motor centre; but I can counterfeit that action by exciting the nerve by which the muscle is supplied at some distant part of its course, electrically, the effect of which, so far as concerns the muscle, will be the same as if it contracted voluntarily. It happens that the nerve which supplies the adductor muscle of the thumb comes in its course very near to the surface—viz., at the elbow. I can, therefore, at any moment, by causing an induction shock to flash through the ulnar nerve at the elbow, produce the desired muscular action. The moment at which this occurs is not the moment at which the muscle contracts; it precedes it by an extremely short but yet measurable interval of time.

Let us, before proceeding farther, agree to call the first act, that by which the induction shock is sent through the muscles, the *signal*; the second—viz., the contraction of the muscle, the *event*. In the case before us the signal is given by the closing of a voltaic circuit. If the lever on which the thumb acts is so arranged that when pulled upon it breaks the same circuit, then we have the two acts of which the true difference is required indicated by the duration of the current, so that if

that duration can be measured it gives us all that we want. Now there are two methods of measuring the duration of a voltaic current, both of which are very commonly employed in physiology. One may be called the graphical, the other the electrical. The principle of the graphical method is this:—Having a sheet of paper which moves horizontally at a uniform rate by clockwork (say one metre per second), if I can by any mechanism make a mark upon that paper at the moment at which the current begins, and another when it ends, I shall find that the two marks are separated from each other by a horizontal interval, the length of which corresponds to the duration of the current. Thus, if the current has lasted one-hundredth of a second, it is certain the interval will measure one-hundredth of a metre, or one centimetre. But the record will not be correct unless the mechanism employed be of such a nature that there is either absolutely no loss of time in making either mark, or the loss is exactly equal in the two cases. Now it is easy to secure these conditions. The simplest contrivances for the purpose are those in which both signal and event are indicated by the motions of a soft iron plate, which is supported by a spring over an electro-magnet in such a way that the spring and the magnet act upon it in opposite directions. Thus, in the apparatus on the table, which is much used for a variety of purposes connected with time-measurement, you have a good illustration of this principle. With its aid I shall be able to make an experiment so as to exemplify the method. You will see in a moment, from the diagram which exhibits the arrangement, that the *signal* by which the person experimented on is acted upon, and the *event*—i.e., the muscular movement which results—must coincide, the one with the opening, the other with the closing, of a voltaic circuit in which the electro-magnet is included. Consequently there must be mechanical or electrical arrangements of such a nature that on the one hand A can promptly give his signal and close the circuit by the same act, while B, on the other, can acknowledge the signal and open the circuit also by the same act.

Let us now proceed to the experiment. We will compare two kinds of signals—a sound signal, and one acting through the nerves of common sensation. For both purposes I will be myself the subject of experiment. The signal will be given from the other end of the table, in the one case by a bell which will be rung by the same current which marks the time on the recording cylinder; in the other, by an induction-shock, which I will receive on the tip of my tongue. In the two instances the process is similar but not identical. In both the centre is the same, and the motor nerves by which it discharges itself are the same, but the afferent nerves, and particularly the terminal apparatus on which the signal directly acts, are different.

Let me now direct attention to the results. In either case the result is a horizontal straight line written on the cylinder, of which the end and beginning are indicated by the marks made by the lever. How do we translate this straight line into time? It must be done by comparison with an invariable standard. The time-value of the line depends on the rate of movement, and the only way by which we can determine this rate with accuracy is by comparison with an invariable

standard. You have before you a tuning-fork which, as you hear, is kept in vibration by a powerful electro-magnet, to which it stands in the same relation as the hammer of an ordinary induction apparatus stands to its electro-magnet, interrupting the current in exactly the same way. The fork vibrates 250 times per second. Each vibration therefore lasts four-thousandths of a second. If, therefore, I allow the fork to trace its vibrations simultaneously on the cylinder, immediately below the line I want to measure, it is obvious that I shall be able, without the slightest difficulty, to determine the time occupied in drawing the line. Employing the apparatus you now see, I am able to measure with accuracy to one five-hundredth of a second.

Some one will now perhaps be disposed to ask—What is the use of all this? Want of time renders it impossible to answer this question fully. I must content myself with a single example. It is now well known that by exciting certain spots on the surface of the brain definite movements of the limbs of animals can be determined. Of these movements two explanations have been given. On the one hand, it is said that the effects are due to the excitation of the *centres* from which proceed the motor nerves from which the muscles thrown into action derive their supply; while, on the other, it is supposed that a complicated series of changes originate in the brain in consequence of the excitation—more or less analogous to a psychical process—of which the muscular contraction is the final event. Of these two alternatives we are able to exclude the first by time-measurement. If the process is one of excitation of the origins of motor nerves, the time occupied ought not to exceed, say, a fortieth of a second. The actual interval between excitation (signal) and the result (event), is ten times as long. We are therefore sure that we have not to do with a mere transmission of excitation along motor channels.

I have now, in conclusion, to speak of the other kind of measurement to which I previously referred, the measurement of changes of form of organs in relation to the time occupied.

For this purpose the biologist uses graphic apparatus of the most various kinds, of which you will have some beautiful examples brought before you to-day. For the most part these have for their purpose the transference of a rhythmical to-and-fro vital movement to a lever of some kind, the motions of which, by virtue of the mechanical arrangements by which it is brought into relation with the organ or limb, imitate its movements exactly. I cannot refer to better examples than those which are to be seen in the Donders and Marey collection. But it has always been recognised that it would be of great importance to obtain direct records of changes of volume of organs or organisms independently of changes of form. We have in the collection two instances in which methods for this purpose have been applied with great success.

In the apparatus devised by Professor Hering for recording the respiratory movements (No. 3769) the animal to be observed is placed in an air-tight chamber possessing two openings. Of these, one communicates (air-tight) with the respiratory cavity, the other with a manometer. This being the case, it is obvious that, the volume of the chamber being known, the variations of

bulk of the animal due to respiration are accurately expressed by the variations of pressure.

Another application of a similar principle (with the exception that the closed chamber is filled with water, not with air) is one of such great importance that I shall venture to occupy a little more time in describing it to you.

The instrument in question is called the plethysmograph. Its purpose is to measure and register the changes of volume which a limb or any other living organ undergoes in varying conditions of the circulation. It has been long known that living parts vary in bulk according to the quantity of blood which they contain; but here, as in almost every other subject in physiology, all the precise knowledge we possess has been gained within a comparatively recent period. I bring it before you because the discovery of an exact method which has now been accomplished by Dr. Mosso, of Turin, is of the highest practical importance.

The arm is enclosed in a cylinder of glass entirely filled with water, the closure of the mouth of the cylinder being effected by a perforated diaphragm of india-rubber. The cavity of the cylinder communicates, by a tube, with a manometer of a peculiar kind, in the construction of which the perfection of the apparatus is most apparent. It can be readily understood by the model. Imagine in the first instance a beaker filled with distilled water, in which a test-tube containing the same liquid floats vertically. Then let us suppose that the end of the tube leading from the cylinder is bent downwards so as to dip into the liquid contained in the test-tube, so that this liquid is continuous by means of the contents of the connecting tube with the liquid which fills the cylinder. This being the case, it is obvious that the test-tube will become heavier and descend whenever the arm enlarges, and *vice versa*. Dr. Mosso has found that by properly adjusting the relative densities of the two liquids (in the beaker and test-tube), it is possible to render the gauge so extremely sensitive that the slightest fluctuations in bulk of the limb are faithfully indicated by the vertical movements of the test-tube.

In order to convert the apparatus just described into a recording instrument, all that is necessary is to write the vertical movements of the test-tube on a surface moving by clockwork. This has been successfully accomplished by Dr. Mosso, and I will now ask your attention for a moment to some of the results.

It can be shown, first of all, not only that variation of bulk of an organ is a much finer test of the state of its circulation than was previously supposed, but that the capillary circulation itself is affected by varying conditions of other functions, with a readiness which, to say the least, is very surprising. I will refer to one or two instances only. Probably everyone is aware that the circulation is much interfered with by the emotions, and that many persons blush for very inadequate reasons. Dr. Mosso has shown not only that emotions so slight that we are entirely unconscious of them produce effects on the circulation of the most definite character, but that even purely intellectual acts, such, for example, as the act of calculating, are attended with a marked diminution of the blood-stream in the superficial parts of our bodies. I will not occupy your time with describing Dr. Mosso's investi-

gations, as I hope that some further account of them will be given by Mr. Gaskell. I am glad, however, in the absence of Dr. Mosso, to have had the opportunity of bringing his apparatus under your notice, because, in my judgment, the introduction of his method constitutes an important step towards bringing within our reach, in our investigations of the varying conditions of the circulation in man, a degree of exactitude which has been hitherto attainable only in experiments on animals.

## A Clinical Lecture

ON

## SEPTICÆMIA.

*Delivered Jan. 26th, 1876,*

By S. MESSENGER BRADLEY, F.R.C.S.,

Surgeon to the Manchester Royal Infirmary.

GENTLEMEN,—In June last year I admitted a man into the Manchester Royal Infirmary with hydrocele of the tunica vaginalis, which had resisted ordinary means of cure. The day after admission I tapped him once more, when, for the first time, I discovered a second sac, encysted hydrocele of the cord, on the same side. This I also tapped, and injected both sacs with tincture of iodine. This little operation was followed by suppuration, and on the third day by grave constitutional disturbance; temperature rising to 103°, and the pulse to 130; countenance anxious; tongue dry and furred; much restlessness, profuse sweatings, and rigors.

The sac of the tunica vaginalis was freely laid open and half a pint of fetid pus evacuated. The general symptoms were for a short time relieved; but the following day diarrhoea ensued, the temperature again rose, and the patient died delirious six days after the paracentesis had been performed. There was no evidence of thrombosis, embolism, or visceral abscesses; in a word, the man died of septicæmia.

A few months after this, Walter Searson, curator of the Owens College Medical School, pricked his thumb while dissecting a tiger for the museum, and two days afterwards began to suffer pain at the seat of injury. On the fourth day he called to see me, when I found a small quantity of thin fluid discharging at the root of the thumb-nail. The lymphatics were perceptibly affected, the skin was cool, the tongue dry, pulse 100; but perhaps the most noticeable symptom was intense depression of spirits. I freely incised the thumb and sent him home to bed: this was Aug. 22nd. From this day his general condition grew worse, up to the 26th, when an ill-defined, or rather an undefined, abscess appeared in the cellular tissue of the arm. On being opened several ounces of pus were discharged, which lay loosely in the tissues unconfined by any limiting membrane. Each day fresh abscesses of the same diffident character appeared on the chest, abdomen, legs and feet. He was very restless, and passed gradually from a condi-

tion of prostration into one of muttering delirium, which ended in death on September 11th, twenty-four days after the reception of the poison. The secretion of urine was almost entirely suppressed for the twenty-four hours preceding death, and the breathing was both rapid and difficult, auscultation revealing extensive moist crepitation of both lungs. There was no post-mortem, but this was clearly a case of pyæmia.

At the same time that the man with the hydrocele lay dying of septicæmia, a youth with a compound fracture of his leg was brought into the same ward. He was a healthy lad, and there was nothing in the case to cause alarm; indeed, it was one of those cases of which, with proper surroundings, we may safely predicate a sure and speedy recovery. After lying, however, in juxtaposition to the septicæmic patient, the young fellow fell a victim to the same disease, and it was only after two months of great peril that he contrived to drift through the disease into a slow convalescence.

These three cases may serve as types: the first arising *de novo*, the septic material being manufactured by the patient himself—a consequence only possible in certain conditions of the system. This is the class of case met with in private practice. The second case illustrates the production of the disease by direct inoculation from without; while the third affords an illustration of the mode in which the malady is conveyed in hospital from patient to patient.

I draw no distinction between septicæmia and pyæmia, believing that if there is a distinction, it is a distinction without a difference. Both are caused by organic matter (septic germs) entering the general system: in the first and third cases entering probably by the veins; in the second by the lymphatics. In the first case the poison killed without visceral lesion; in the second it gave rise to thrombosis in the veins, which, being detached, became the nuclei of suppurations scattered throughout the cellular tissue generally and the various viscera. But clearly these are only unimportant varieties of one pathological condition, which we may conveniently term septicæmia.\* Now in studying this condition of septicæmia, we shall learn something of its nature and how to prevent it by turning to another variety of the same disease—I mean that form of puerperal fever which depends for its production upon puerperal peritonitis. As in ordinary pyæmia, cases of puerperal fever occur sporadically, so to speak—spring up away from a hospital, in patients surrounded by everything which we should consider antagonistic to its development. In these cases, however, we can nearly always trace the presence of some putrefying organic matter—a bit of placenta, &c.,—just as we can in isolated instances of pyæmia; as in ordinary pyæmia, too, puerperal peritonitis is clearly contagious, conveyed with

\* I am quite aware that Drs. Moxon, Goodhart, and others, have examined the blood of patients dying of pyæmia without finding bacteria. I should imagine in most cases of pyæmia without wounds communicating with the air—when, for example, the disease commences in a necrosis—there would be few bacteria present; but in many respects this clearly differs from the infective form of the disease, where the evident origin of the evil is putrefying organic matter. I conceive that in all cases of septicæmia the constitutional condition of the patient must play a large part; even in such a disease as ringworm, where the producing organism is, comparatively to the minute bacteria, gigantic, the patient himself greatly influences the development of the fungus. As easily try to grow corn in water as ringworm in certain human soils, and it is so probably with the poison of septicæmia.

fatal certainty from patient to patient by the hands of doctor or midwife.

We can, however, advance still further towards a conclusion as to the real character of the poison and as to the mode in which it must be destroyed. The experiments of Chauveau and Burdon Sanderson demonstrate that if a septic fluid capable of producing toxæmia when injected into the veins of a living animal be strained through a porcelain filter, the liquor so filtered may now be injected with impunity, whereas the solid residue remaining on the filter retains in full force all the septic properties of the original fluid matter. This residue is shown to entirely consist of bacteria. Whether these bacteria be the very incarnation of the poison, or merely act as beasts of burden for it, is a question which exercises the minds of curious men, but need not here detain us, having established the fact that bacteria are essential to the production of septicæmia.

We have learned a good deal of late about these organisms. We know, amongst other things concerning them, that they are heavier than air—e.g., in Tyndall's recent experiments upon the non-septic properties of optically pure air it is shown that three days suffice for gravitation to deposit all the floating germs upon the bottom of the little boxes which he uses; and that the poison of septicæmia is likewise of a comparatively heavy nature is evident in the clinical history of puerperal fever, which teaches us that the spread of the disease may always be traced to human go-betweens, and is never conveyed from patient to patient by mere diffusion through the air. It is of course possible that, in a crowded hospital, poison-germs may be wafted from the wound of a septicæmic patient and alight upon the open sore of a neighboring case, when it will, in turn, give rise to the disease; but the whole history of septicæmia differs markedly from diseases which, in their wide and rapid spread, seem to depend upon the diffusion of septic gases.

Assuming, then, the point to be conceded that septicæmia does not depend on gaseous diffusion, and coupling the facts that it never occurs without putrefying organic matter and that putrefaction requires the presence of living germs, we are not postulating too much in affirming that the destruction of the germs must render the spread of the disease impossible. To what practical issue does this lead us? You all know, gentlemen, what just odium attaches to the surgeon who, after one clear case of puerperal fever, allows himself to become the medium of its conveyance to another victim: not only moral pains and penalties are his, but the arm of the law deals with him sharply. Now I confess it seems inconsistent to be so careful in one case and so careless in the other. All authorities admit the contagiousness of pyæmia; nearly all agree that it is carried only by actual contact from case to case; and yet we see, every day, cases of pyæmia remaining in wards crowded with open wounds (wounds with open vessels ready to absorb everything, good or bad), and all these cases under the care of the same surgeon, house-surgeon, and nurses. Surely it is not asking too much to insist upon a separate ward, where any case of septicæmia should be transferred, and which ward should be looked after by an entirely separate staff of attendants.

But, gentlemen, it is not enough to isolate our cases; we must purify our wards; and this subject naturally divides itself into two:—1st. What test

have we, besides that of the ill-doing of our patients, that our wards are impure? 2nd. What are the best means of purifying them? Unfortunately chemistry, to which we naturally turn, yields no satisfactory reply as to the detection of organic impurities. But it does give us an answer, though in a somewhat roundabout way; for, having discovered that the quantity of carbonic acid in the air is constant, being almost exactly the same in a London court and at the summit of Mont Blanc, and that any excess in the carbonic acid is an indication of organic impurities in the air,—in this way chemistry does enable us to get at some precise results. Let us, then, adopt this method of investigation in examining the condition of our own hospital. In accordance with my request, Mr. Thomas Harrison, F.C.S., a very competent authority, on January 14th of this year, examined the air of certain wards in the hospital with the following results:

*Estimate of the quantity of CO<sub>2</sub> in 10,000 volumes of air.*

Average quantity of CO<sub>2</sub> in 10,000 volumes of Manchester air, 4.

|                             |    |
|-----------------------------|----|
| President ward ... ..       | 18 |
| Humphry Nicholl ward ... .. | 8  |
| Passage adjoining... ..     | 4  |

I shall not further allude to the condition of the President ward than to say that, be the cause what it may, such a condition of air as is here revealed is an unfit atmosphere for sick people. What I wish more particularly to draw your attention to is the condition of Humphry Nicholl ward. Owing to a recent epidemic of erysipelas, this ward had been cleared out a month before the analysis was made, and both windows and ventilators kept open ever since; yet we find that the quantity of carbonic acid is exactly double that in the adjoining passage. If you ask me how I explain this remarkable fact, I can only answer that I imagine it to be caused by hordes of bacteria which are forever discharging carbonic acid into the air like so many little Christians. This supposition, which I quite admit seems somewhat fanciful, receives support from another experiment performed by Mr. Harrison, who, on Jan. 16th, examined the air of the ashpit of his back yard. On this occasion he found 14·08 parts of carbonic acid in 10,000 volumes of air. Having ascertained so much, he discharged a quantity of ozone for thirty seconds, and then found only 10·2 parts of carbonic acid. Now, as ozone has no effect upon carbonic acid, this result is only explicable on the theory that ozone arrests the fresh formation of carbonic acid. We know that ozone destroys the life of bacteria; we know also that bacteria emit carbonic acid: hence it seems a fair inference that the extraordinary quantity of carbonic acid is due to the presence of aerial hosts of these minute organisms.

That bacteria do exist in the air of our hospital is quite certain. In 1868 Mr. Lund examined the air of the hospital, and found bacteria in abundance. Dr. Dreschfeld, at my request, lately exposed some papers moistened with water and glycerine to the air of some of the hospital wards, and found bacteria, though, he informs me, in very small numbers. I supplemented his experiments by repeating those which Mr. Lund had made, and found that the distilled water with which the flasks which I used were filled became turbid with bacteria in a few days.

Now, gentlemen, bearing in mind the fact that ozone destroys organic matter, and remembering that it is organic matter which gives rise to the putrefactive changes of septicæmia, let us inquire how we can practically bring this agent to bear. I find that the air of Manchester is absolutely devoid of this natural antiseptic, but it fortunately happens that nothing is easier than to manufacture ozone, and this, too, quite on a grand scale. With a Rumkopf coil, such as this, and one of these generators of Tisley's, you could fill the largest ward in this hospital with ozone in a few hours. Now that I put the battery in action, so as to electrify the oxygen as it passes through the tube, you see the gas in its changed state coming off in large quantities, blackening this prepared paper, and changing this solution of starch and iodide of potassium into a deep and beautiful blue. Without venturing to affirm that every antiseptic acts simply as an oxidising agent, we may safely affirm that no antiseptic is so potent as nascent oxygen or ozone; hence it seems to me that when an epidemic of septicæmia has vitiated the air of our wards we should resort to this agent for purification.

These experiments, to which I have before alluded, may be taken as proving that the air of the hospital is impure; yet, if we examine our statistics, we find that they compare favorably with those of most other hospitals. The best cases to take are probably amputations, as they are numerous enough to afford reliable grounds for comparison, and do not depend for their result on any special skill in the operator. Professor Simpson, whose *hospital* statistics were never impugned, stated that "all amputations of all the four limbs in eleven of the largest general hospitals of the country gave a mortality of 41.6 per cent., or nearly 1 in 2.4." Erichsen found that 80 consecutive cases of amputations at University College Hospital, from July 1st, 1870, to December 1st, 1873, gave a mortality of 26.2 per cent. Of 307 amputations performed by himself, 79, or 25 per cent., died. At our own hospital, from 1868 to 1873, 304 amputations, whose results are tabulated, were performed, excluding all amputations of the hand and lower third of forearm and of the foot and ankle. Of these 77 died, giving a mortality of 25 per cent.; if, however, we include the previously excluded amputations, we reduce the mortality from 25 to 20 per cent., being 2 per cent. below that of University College Hospital, and 2 per cent. above that of St. Bartholomew's, where the mortality of late years has been reduced to 18 per cent. But, gentlemen, although by cleanliness and care we have reduced the mortality to a percentage which compares favorably with that of the best metropolitan hospitals, we should not rest satisfied with such a result when we are acquainted with the fact that in a bygone generation, and with ruder means at his command, Guthrie, during the Peninsular war, lost but one case in twelve of all his amputations, being a mortality of only 8 per cent. We should not, indeed, justly rest satisfied until we have achieved an equal success with his, especially when we know the only cause for the great disparity lies in the comparative purity of the air. At the debate on pyæmia at the Clinical Society last year, Spencer Wells and Dr. Gordon made statements bearing upon this question, the one referring to the hospitals at Malta, the other to the Parisian ambu-

lances during the Franco-Prussian war; their statements proved that the mortality was ever in direct proportion to the quality and quantity of the air.

As I have said, gentlemen, there is no ozone in the air of our city, but it is abundantly present in the outskirts, and these papers, which are so deeply colored by ozone, received the tinge by being exposed for a few hours in that of Oxford-road, where the Infirmary Committee urge the erection of the future hospital.

To what conclusions, gentlemen, do these thoughts lead us? Let me briefly restate the case by way of answer. I have endeavored to show that pyæmia, septicæmia, and puerperal peritonitis (all varieties of one disease, which may be generically termed septicæmia) are associated with the development of organic germs, "bacteria," which act either as the carriers of the poison or as the poison itself; that septicæmia may be, and is, carried in a hospital from one patient to another by surgeon or nurse; that all cases of septicæmia occurring in a hospital should be at once removed and effectually isolated from contact with the other cases; that as ozone destroys the vitality of bacteria, ozone should be employed to purify our wards when septicæmia has appeared in them; that this may be readily effected in a few hours by means of a small battery and Tisley's ozone generator; that the air in the Manchester Infirmary is impure, and therefore deleterious, but that, notwithstanding this, our death-rate, in consequence probably of the great attention paid to cleanliness, compares favorably with that of other hospitals; that, however, when we recall the achievements of Guthrie in the Peninsular war of sixty years ago, we must consider this mortality really excessive, and should constantly urge the necessity of our hospital being built on better principles and in a purer air.

## Clinical Lecture

ON

### OSTEO-MYELITIS AND ACUTE PERIOSTITIS.

By C. MACNAMARA, F.C.U.,

Surgeon to the Westminster Hospital.

GENTLEMEN,—I shall direct your attention to-day, first, to the subject of osteo-myelitis, or inflammation of the contents of the medullary and Haversian canals, including the spaces in the spongy portion of the long bones; and, secondly, briefly consider the effects produced by this form of disease as compared with that caused by periostitis.

Osteo-myelitis may be either acute or chronic in its course, but unless as a complication following operations or injuries of the long bones, the acute form of the disease is not often met with in this country. On the other hand, chronic inflammation of the contents of the spongy portions of various bones is a fertile source of mischief, not only to the osseous tissue, but also to joints situated in the proximity of the disease, because, as I shall

subsequently explain to you, a cavity of this kind affords the easiest exit to the products of the inflamed structures. You are aware that in the soft tissues of the body the materials arising from the process of inflammation are, as a rule, prevented from entering the blood, not only by the contraction and plugging of the vessels surrounding the inflamed area, but also in consequence of the new cell-formation which occurs in the part effectually closing the capillaries, and probably preventing the absorption of putrid material into the circulation through the radicles of the lymphatic system. And there can be no doubt that in instances of chronic osteitis the surrounding Haversian canals and medullary spaces become occluded; nevertheless, the formation of the vascular system in bone is eminently adapted for the absorption into the circulation of putrid matter formed in it, and hence we find in practice that over and above the death of the bone resulting from acute osteomyelitis the patient runs a very great risk from pyæmia. Professor Longmore has noticed that, after trivial gunshot injuries involving the periosteum, acute inflammation of the contents of the medullary canal sometimes occurred, followed by the death of the patient from septicæmia. But Sir J. Fayrer has without doubt done more to elucidate the circumstances of osteo-myelitis than any other living authority, a large portion of his experience, like my own, having been acquired in the tropics, where osteo-myelitis and pyæmia are more frequently met with than in this country. In fact, some ten years ago it was rather the exception than otherwise not to have osteo-myelitis among our hospital patients in Calcutta after amputations or compound fractures of the extremities. It is true that, stricter attention having been given to the sanitary condition of these institutions, and in my own practice, after the introduction of the antiseptic system of dressing, we lost fewer cases from pyæmia; but I confess that this improvement was partly due to other than atmospheric influences, because cases of osteitis and pyæmia sometimes occur without the admission of air into the inflamed parts—for instance, after injuries to the skull, although no breach of continuity of the scalp has taken place, I have seen the most rapid and deadly septic poisoning supervene,—but, as I said before, the carbolic spray and antiseptic dressing have, I believe, saved the lives of a considerable number of the patients in the hospital I was formerly attached to.

It does not seem to me that there is any great difficulty in diagnosing a case of osteo-myelitis, especially if the disease follows on injury to the bone. The patient under these circumstances may appear to be doing well for the first week or ten days after the operation: the stump or wound, as the case may be, perhaps looks in a satisfactory condition; there is no deep-seated pain or external signs of inflammation; but the patient's temperature rises suddenly, and he complains of rigors, or it may be only of a chill, followed by perspiration, his tongue becomes dry and brown, the pulse and breathing rapid, and the skin and conjunctiva assume a dull, yellowish appearance; but, above all, the temperature of the patient's body rises and falls suddenly within the course of a few hours. Symptoms such as these indicate pyæmia, and I need hardly remark they are different from those of ordinary surgical fever, which usually supervenes some twelve or sixteen hours after an opera-

tion. The patient's eye is bright and glistening, his face and forehead are flushed, the skin feeling healthy to the touch, though hot and dry; in fact, the difference between pyæmia and surgical fever are as distinct as that between any two members of the same family can well be, although it is not always easy to describe their characteristic features in words. The more closely, however, you watch these fevers at the bedside, the clearer will their respective peculiarities dawn upon you, and enable you, without hesitation, to give an opinion as to the form of fever from which your patient is suffering. But the symptoms I have referred to only allow us to arrive at the conclusion that the case is one of septic poisoning; they do not determine the point as to the existence or otherwise of osteomyelitis. To satisfy ourselves on this matter we must pass a probe down to the medullary canal of the injured bone, and if we find that its cellular lining has been destroyed, and we discover bare bone for some distance along the course of the canal, we should not hesitate to lay open the wound, and accurately ascertain the state of the osseous tissue. It may possibly be that only limited necrosis exists, but in this case it is hardly likely that the pyæmia is the result of the absorption of putrid matter lodged in the osseous structures. In the early stages of osteomyelitis the contents of the medullary canal may be seen protruding from the end of the bone as a red fungating mass; but this condition soon passes away, the contents of the canal suppurate, and we shall find it empty, its walls denuded of their lining membrane; in fact, necrosis of the bone surrounding the canal will have taken place. Under these circumstances, Sir J. Fayrer insists on the fact that the best chance we have of saving the patient's life is to amputate (or reamputate) the limb at, or above, the joint above the diseased bone; and I quite agree with him as to the necessity of this line of practice, for it is only by the entire removal of the source from which the putrid matter is being absorbed into the blood that we can hope to preserve the patient's life.

But, as I have before remarked, you are not to suppose that acute osteo-myelitis only occurs in cases of direct injury to the osseous tissue; for, as Mr. Savory and other authorities have observed, the exposure of a limb to sudden extremes of heat and cold, such as plunging the legs and feet into ice-cold or very warm water, may set up acute osteitis in the part exposed to treatment of this kind, and the case now under our treatment in St. Luke's ward is an instance in point.

W. S—, aged ten, was admitted into the Westminster Hospital on Feb. 8th. The patient's father and mother are strong and well-to-do country people; there is no suspicion of any marked hereditary disease in this case, and our patient, though slim, has been a very healthy boy up to the present time. He was perfectly well until December 20th, when, on his way home from school, he fell through the ice into a pool of water, and got his feet and legs wet. In this condition he returned to his cottage. The weather was very cold at the time, and in the evening his legs became extremely painful, and his mother, thinking he had rheumatism, applied hot poultices to his limbs. The patient has since been confined to his bed; his legs became much swollen; after some three weeks two abscesses burst in front of the right shin, and subsequently another formed over the ankle-joint.



and discharged a small quantity of matter. The skin inflamed over the left foot in a similar manner. The patient was seen in January by Mr. T. Eager, of Woking, and, by his direction, removed as soon as practicable to the hospital. On admission we found that the right leg and foot were pale, swollen, and very cedematous, with three ulcers along the shin and over the ankle joint; there was no discharge from these sores, but on passing a probe through the upper ones, we came down upon soft disintegrated bone; the instrument could be thrust deeply into the dead bone. The left foot was affected in the same way. Our patient was much emaciated, with a dull jaundiced eye, dry brown tongue, a small very rapid pulse, and respiration 42 in the minute. His skin felt clammy, and was covered at times by profuse perspiration, the temperature of his body rising and falling rapidly from  $101^{\circ}$  to  $105^{\circ}$ . There could be no doubt as to his being under the influence of septic poisoning, arising in all human probability from the absorption of matter about the dead tibia.

I could not obtain permission to remove the limb until the 15th of February, when the leg was amputated at the knee-joint. The patient suffered from diarrhoea after the operation, and it was with some difficulty we managed to control the purging; but, with this exception, he has improved rapidly in health, and is now convalescent.

In passing, let me warn you not to think lightly of diarrhoea in cases of pyæmia, or to foster the notion that purging of this kind is an effort of nature to eliminate the poison from the system. My experience leads me to think that diarrhoea in these cases is an indication of extreme exhaustion, and, unless you can control it by means of opium and astringents, the prognosis must be a very unfavorable one.

But I would draw your attention to the condition of the amputated limb. The tibia I show you was taken from the leg immediately after it had been removed from the body, and it has since undergone no maceration or preparation of any kind, and you observe its cancellated structure and medullary canal are entirely destroyed. It looks just like a bit of old worm-eaten wood. The outer shell of the bone is more healthy than any other part of the tibia. And all this mischief has been the work of less than seven weeks' disease. The patient was suffering from great pain in the knee-joint before the operation, and, although the articular cartilages covering the lower end of the femur were found to be healthy, it was nevertheless a hazardous proceeding amputating as I did through the joint; for you must bear in mind the fact that there is a great tendency for osteomyelitis to extend from the bone affected to contiguous bones, without the intervening joint (if there happen to be one) being affected. In fact, I think that pyæmia commencing from osteomyelitis does not, as a rule, give rise to abscess in the walls, the lungs first, and then the liver, are the most common seats of those isolated spots of necrosed tissue which are generally described as secondary abscesses. If you examine the lower end of the tibia and the astragalus taken from W. S.—'s leg, you will clearly appreciate the bearing of the remark I made regarding amputation through the knee-joint, for you will notice that there is a large isolated cavity in the lower end of the tibia, which was the seat of an abscess. The periosteum covering this portion of the bone, and

that over the astragalus, is, as you observe, perfectly healthy. The cartilage lining the osseous surfaces of the ankle-joint is unaffected, but beneath the cartilage of the upper surface of the astragalus you see there is another cavity, the seat of a second abscess; and a similar abscess has formed in the cancellated tissue of the bone, and passing forwards, has burst into the astragaloscaphoid articulation. But I would call your special attention to this deep red patch of cancellated tissue beneath the cartilage lining the lower surface of the bone; you may notice that it is surrounded by apparently healthy osseous tissue, the patch itself being a spot of highly inflamed bone. I have examined sections of the part under the microscope in the fresh state, and shall describe its condition to you in the next lecture; for the present, I may observe that we have in the inflamed spot an example of the earliest stage of the process which, after continuing for a time, has led to the abscesses above referred to in the astragalus, and which has reduced the tibia to the necrosed condition in which you now see it. But as I said before, this patch of inflamed tissue in the astragalus is separated by healthy bone from surrounding abscesses, and I have so often seen similar instances of acute osteo-mylitis leading to this condition that I urge you strongly, in amputating in cases of this kind, to cut beyond the joint next above the site of the disease.

Osteitis, however, is not by any means always the acute affection I have illustrated by the case of S.—, for in the next bed to his there is a patient, H. T.—, whose os calcis I excised some seventeen days since. The bone, as you see, is covered with healthy periosteum, but in its centre there is a cavity as large as the top of one's little finger, and from this, leading down to the lower surface of the bone, is a passage through which the products of the inflamed tissues found their way, but then meeting with resistance from the dense structures covering the heel, the matter had forced a passage up along the exterior of the bone, and burst through the skin on either side of the foot.

H. T.— was sent up by Dr. Ferris, of Uxbridge, and placed under my care in this hospital on the 2nd of March. He states that four years ago he thought he must have sprained his foot, as he was seized with violent pain in the heel; this lasted for some months, and then abscesses formed on either side of the heel, which burst and relieved the pain, but the wounds have continued to discharge ever since. The boy has enlarged cervical glands, and is doubtless of a strumous diathesis. On passing a probe through the fistulous openings no bare bone could be discovered; the reason of this is now apparent from the course the matter had taken to reach the surface. You will observe that the cavity in this os calcis contains no dead bone, and further that its walls are lined with a compact layer of osseous structure, corresponding to the walls of a chronic abscess of the soft parts of the body. But if in place of opening externally, as the collection of matter in this os calcis has done, the abscess had been so situated that the point of least resistance for the pus to have taken had been into a joint, the result would have been to excite changes in the part resulting in the destruction of the articulation. And this is doubtless the history of some cases of joint disease; or, in other words, chronic osteitis, though by no means always ending in abscess, occurring in the spongy ends of one

of the long bones, may terminate in partial disintegration of the bone, and destruction of a neighboring joint. On the other hand, it is quite possible that inflammation occurring in the cancellated tissue of bone may pass off without leading to further mischief in the part than a certain amount of enlargement and consolidation of the structures implicated in the diseased action.

It is hardly possible for me to draw your attention to more instructive specimens of diseased bone than those I now show you, as contrasted with the shaft of this fibula, which I lately excised from the leg of a little boy in Luke ward. In this instance we have an example of acute periostitis in contradistinction to inflammation, commencing in, and being chiefly confined to, the contents of the medullary and spongy portion of the bone; and you will observe the difference between the shaft of this tibia affected by osteo-mylitis, and this fibula in which the periosteum has been destroyed by acute inflammation. In the former specimen we have seen that the whole of the cancellated structure of the bone is necrosed; but in this fibula the external layers only of the bone are implicated, although it is absolutely bare of periosteum from end to end. The superficial layers of the bone are affected in this latter case because the external layers of the long bones grow from and receive their vessels through the periosteum; but, as we learn from a longitudinal section through the bone, the medullary canal and the cancellated tissue are perfectly healthy.

W. C—, aged six, was admitted into this hospital on Dec. 21st, 1875. He states that his school-mistress struck him with a cane across the leg. The limb became swollen and very painful. The child's mother has lost the bone of her nose from disease, and the patient is a sickly-looking little fellow. On admission we found the right leg very much swollen, of brawny hardness, and there were all the indications of a deep-seated abscess in the muscles of the calf of the leg. On the 23rd a grooved needle was passed into the inflamed structure, but, as no matter appeared, a deep incision was made down to the bone, and a very considerable quantity of pus escaped from the wound. On the 27th another free cut was made along the lower part of the fibula so as to give free exit to the matter. Bare bone was distinctly felt, but we delayed further proceedings at the time because in some few cases of the kind the periosteum which has been separated from the bone by the products of inflammation, so soon as these have escaped, reunites to the osseous tissue, and considerable superficial necrosis of the shaft of the bone is prevented. But as the discharge in this case became very profuse indeed, and the child's health was rapidly failing, I cut down on the diseased bone, removed the whole of its shaft, leaving the upper and lower epiphysis *in situ*.

In this instance the inflammation of the periosteum followed a blow over the bone, and at first sight the case looked like one of abscess of the calf of the leg, but on passing a grooved needle down into the muscles no pus could be discovered, and we had to cut upon the bone before the matter flowed into the wound. Two free incisions were, therefore, made into the periosteum. The drain of matter from these was subsequently so profuse that it speedily began to tell on the boy's health, so that I had to remove the shaft of the bone, leaving, however, the upper and lower epiphysis,

for they were covered with periosteum, and I expected that the greater part, if not the whole, of the bone would re-form from these epiphyses; and such has been the case. You can now distinctly trace the outlines of a new fibula under the cicatrix in the skin; in fact, the shaft of the bone has been partly re-formed. One of the most important practical lessons we may learn from the case is, that in "deep-seated abscesses," especially if they occur in the leg or thigh, pass your finger down through the opening you make to allow the pus to escape, and examine the condition of the bone, for in cases of this description you may discover that the inflammation has commenced in the periosteum, and spread outwards into the soft parts. Acute periostitis is not very frequently followed by pyæmia; at the same time, it occurs generally among debilitated children or in adults in bad health, and the separation of the dead from the living bone is a tedious process attended with profuse discharge, which in time may no less surely destroy the patient than pyæmia would in instances of osteo-mylitis.

In the next lecture I shall give you an account of the pathology of osteo-mylitis, and illustrate the subject by specimens prepared from the bones I have shown you to-day.

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## Original Papers.

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### ON GELSEMINUM SEMPERVIRENS.

By SYDNEY RINGER, M.D.,

Professor of Therapeutics at University College,  
and

WM. MURRELL, L.R.C.P., M.R.C.S.,

Demonstrator of Physiology at University College.

(Continued from July No., p. 307.)

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#### THE INFLUENCE OF GELSEMINUM ON RESPIRATION.

DR. BURDON-SANDERSON'S lucid explanation of the effects of gelseminum on respiration has left us but little more to say on this subject. There are, however, one or two points of interest, into the detailed discussion of which he has purposely refrained from entering, and concerning which we may take this opportunity of speaking more fully. The first of these is the subject of the primary action of gelseminum on respiration. We have already shown that the ultimate and most obvious effect of gelseminum is the diminution in the rapidity of the respiratory movements, and the decrease in the excursions or range of motion of the muscles producing this movement. Dr. Burdon-Sanderson has shown, moreover, that this condition of diminished activity is preceded by an opposite condition, in which there is overaction and increased range of movement. It might naturally be supposed that a drug which would augment the range of respiratory movement before depressing it, would in a similar manner increase its frequency before diminishing it. Is such the case? Is this

supposition confirmed by our observations? We think not, for a careful examination of the tracings obtained in our different experiments fails to give in any single instance the slightest indication of primary respiratory quickening. Fearing, however, lest the initial quickening should have been present, and yet should have been of so transitory a nature as not to have been detected, we determined to make some observations which should be especially devoted to the elucidation of this subject.

The question at first sight appears to be sufficiently simple of solution, but is in reality one which requires an unusual amount of care in its investigation. In our earlier experiments we first ascertained by simple observation the rapidity of the chest movements in a rabbit, and then injected the animal subcutaneously with the gelseminum, continuing the observation until the ordinary symptoms of poisoning were developed. We obtained, as we thought, abundant evidence of primary quickening of respiration, but a little closer investigation soon showed that this was due to the excitement and irritation caused by the introduction of the canula of the syringe, and that it was not in any way owing to the action of the drug.

We then attempted to eliminate this source of error by the administration of chloroform. This method also proved unsatisfactory, for it is extremely difficult in the case of the lower animals to administer the anæsthetic uniformly, and a slight increase or diminution in the quantity or state of concentration of the chloroform greatly influences the condition of the animal and its mode of breathing.

Our difficulties were finally overcome by the substitution of chloral for chloroform. The animal (a rabbit) was first injected in the loose areolar tissue in the region of the axilla with twelve minims of a one-in-fifty solution of chloral diluted with saline. It was then returned to its hutch and allowed to remain perfectly quiet in the dark for about half an hour, this method having been found by experience to be conducive to the development of the anæsthetic action of the drug. The animal was then, whilst in a state of perfect insensibility, secured on its back on a rabbit-support, and the canula of the hypodermic syringe was pushed under the skin, so that the gelseminum might at any moment be injected without causing the least disturbance. The respiration was counted at intervals of about two minutes for more than an hour, and was found to be remarkably constant and subject to extremely little variation. An injection of six minims of the liquid extract of gelseminum was then cautiously administered through the previously introduced canula. The chest movements were counted immediately and at successive intervals of a minute, when it was found that the rate was identical with that which had been recorded for a considerable time before the injection. This experiment was repeated three or four times under slightly varying conditions, and the result in each case fully justified the conclusion that gelseminum produced no primary quickening of respiration.

We have already intimated that there are reasons for believing that the respiratory effects of gelseminum are due to the action of the drug neither on the muscles nor on the motor nerves, but of these facts we have as yet given no experimental proof. The investigation of this point is as simple as any which can present itself in the whole range of practical physiology or therapeutics. We killed a

rabbit by the subcutaneous injection of ten drops of the liquid extract of gelseminum, and immediately after the death of the animal opened the thorax and abdomen. The diaphragm was subjected to galvanic stimulation, direct contact of the electrodes producing vigorous contraction. The phrenic nerve was then excited electrically, and was found to conduct well, the diaphragm acting as before. The application of the electrodes to the intercostal muscles showed no want of contractility in that region, while a stimulation of the intercostal nerves demonstrated that their powers of conduction had undergone no impairment.

In the course of our investigations we performed an experiment which has occupied the attention of previous workers in the same field. We did not for one moment suppose that the powerful influence of gelseminum on respiration was caused by the action of the drug on the afferent fibres of the vagus, but we nevertheless considered it advisable, as a matter of precaution, to administer the liquid extract to an animal in which the pneumogastrics had been previously cut. The subject of this experiment was a large Cyprus cat, and the nerves were divided under chloroform in the neighborhood of the larynx. A subcutaneous injection of gelseminum caused as marked a diminution in the rapidity of respiration, and proved fatal as quickly, as in cases in which no operative procedure had been resorted to.

In this article, then, we have given the detailed proof of the following facts:—(1) Gelseminum produces no primary quickening of respiration. (2) It has no direct action on either the diaphragm or intercostal muscles. (3) It paralyzes neither the phrenic nor the intercostal nerves. (4) It diminishes the rate of respiration after both vagi have been cut.

#### ACTION ON MAN.

In order to test the effects of gelseminum on man, we have given it on seventeen occasions to six persons, in doses sufficient to produce decided toxic effects. The tincture we used was made with one part of root to four of rectified spirit. To excite the symptoms characteristic of this drug, we found it generally necessary to give drachm doses hourly for three hours—a quantity which may be given with perfect safety. Some individuals, however, as might be expected, are much more prone to be affected than others. Thus, in one case, two doses of twenty minims at two hours' interval produced well-marked symptoms which lasted all day; and, generally, twenty-minim doses repeated every three hours will, in the course of twenty-four, or at all events in double that time, produce the earlier symptoms presently to be described. On the other hand, we have given drachm doses hourly for six hours with very slight effect; and on one occasion to a delicate young woman we gave twenty minims every three hours for several days, finally producing only slight heaviness in the eyelids.

The symptoms excited by the gelseminum were similar to those described in our first communication, but we think that our recent joint observations are more exact than any previously recorded, and that we have obtained fresh and further information concerning the effects of this interesting drug.

Unless given in dangerous doses, gelseminum affects first and chiefly the eyes and brows. The symptoms generally occur in a certain order; not

without exceptions, however, both in the order and number of the symptoms. The drug first produces pain in the brows, followed soon by giddiness, then by pain in the eyeballs, and soon after by dimness of sight. A larger dose produces double vision without apparent squinting, with a sensation of great heaviness in or under the upper eyelids, with somewhat contracted pupils. A still larger dose causes drooping of the upper lid, sometimes so marked that the edges become nearly closed, and can be opened only by a strong and painful effort; and after straining to open them, sometimes the upper eyelid is so tired that ptosis for a short time becomes complete. The movements of the eyeball are restricted, and in one case were associated with a strong double internal squint. The patient next complains of weakness of the legs, and we have never pushed the drug beyond the production of this symptom. When decidedly under the drug's influence the patient is pale, with a heavy sleepy look. Some say that their eyes feel sleepy; others yawn frequently, and say they can hardly keep awake, and when left to themselves fall asleep. Patients complain also of dryness of the mouth, though the tongue looks moist, and to the finger feels so. Some keep moistening the mouth with a little water, hours even after the discontinuance of the medicine.

Except the internal squinting, these symptoms were all produced in the greatest number of cases; but in some instances even large doses of the tincture induced only a few of the slighter symptoms. Thus a woman took a drachm dose hourly for six hours without exciting headache, diplopia, or giddiness—only great heaviness of the eyes and dimness, almost amounting to temporary loss of sight; though on a former occasion we produced, in this very woman, extreme diplopia with giddiness with four one-drachm doses of the tincture. Diplopia, as we have shown, generally preceded by headache, giddiness, and dimness of sight; but in one instance diplopia occurred without these preliminary symptoms, though, strange to say, on a subsequent occasion, in this same woman, with a larger quantity—that is, six one-drachm doses given hourly—we produced much giddiness and mistiness without diplopia.

The symptoms from gelseminum come on early and soon subside. A single drachm dose rarely produces any marked symptom, but in from ten minutes to a quarter of an hour after the second hourly dose the symptoms appear, and reach their highest point in about half an hour, then quickly subside, most of them ceasing in about an hour. With the repetition of four or six hourly drachm doses the symptoms may persist six or eight hours after the last dose; but the symptoms are most marked half an hour after each dose, and then decline.

We shall now describe each of the symptoms separately and fully.

*Pain in the head and eyes.*—Patients described this pain variously. It was generally limited to the forehead, and most marked just over the eyes. Some called it a dull sensation over the eyes; others, a heavy pain; others, a giddy pain; and one patient experienced pain over the occiput, with a sensation as though the crown of the head were being lifted off in two pieces. This headache was sometimes absent, and sometimes followed instead of preceding the other symptoms. Dull aching pain in the eyeballs, now and then shooting in character, occasionally worse in one ball, some-

times followed and sometimes preceded the headache. The headache and pain in the eyeballs, intensified on moving the eyes, were often severe. When ptosis was well marked the effort to open the eyes widely caused considerable pain, and the patient seemed to get relief by closing them.

*Giddiness* was another prominent and early symptom. Some felt it over the whole head, but by far the larger number said it was limited to the brows. Standing or walking made it much worse. When well marked the patients staggered, and were afraid even to stand, much less to walk. So giddy was one patient that he nearly fell off the form. Some described their heads as going round and round. They felt and seemed drunk, though without any incoherence, still less mental excitement.

*Sight.*—In every case the sight was affected; indeed, dimness of sight and giddiness appear to be the most constant symptoms, and may exist without headache, pain in the eyeballs, or double vision. At first the sight, without being misty, is not so clear as usual; then slight mist comes before the eyes, one patient comparing it to a "lot of smoke rising before his eyes," and another to a "thick veil." The sight at last becomes so affected that it fails almost completely, failing first with distant objects, then, as the sight becomes more impaired, nearer and nearer objects appear bazy. Gelseminum affects, too, the sight in animals. Thus we poisoned a dog, and, after slight muscular weakness was produced, the sight became evidently almost lost, for the animal ran straight against objects without trying to avoid them, evidently not seeing them.

*Diplopia.*—The drug seems to produce two kinds of diplopia, one much more persistent than the other. As to the transient kind, we find it on many occasions a very passing phenomenon, lasting only a few seconds, then disappearing, then, after a few minutes, reappearing. In this form images in the median vertical line appeared double, distant objects at first undergoing the duplication. Sometimes the patient was conscious that the diplopia was coming on: thus one woman said, "I know it is now coming on; I feel such a heavy weight under my upper eyelid." The double vision then came on, and, with the heaviness, ceased in a few seconds. One image was higher than the other; in this respect the images varied much. The following descriptive notes were taken down rapidly by Mr. T. Fox from the patient, the phenomena occurring as fast as they could be written: "One gas jet appears about six inches above the other, and there is six inches between them horizontally; the upper one is to the left; now the right is uppermost; now the left slightly again; going over to right now again; exactly over one another now, and quite close together; now again separated, left the highest; now over one another." With other patients the two images seem on a level. Sometimes the drug produces only this transient kind of diplopia; at other times both kinds; and sometimes one kind preceded the other, the transient usually preceding the more constant form, and continuing to recur from time to time, while the constant form lasted.

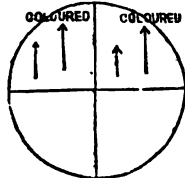
The phenomena of the constant form of diplopia follow a definite order, and take place in the upper half only of the field of vision. They occurred first with objects held at the extreme right or left of the visual field; and as the patient passed more

under the influence of the drug, then with objects held nearer and nearer the middle line; and at last, usually for a short time only, objects in the median vertical plane seemed double. As the effect of the drug wore off, the double vision disappeared in the inverse order. The outer lateral image was the higher, and the further the object was carried to the right or left the greater was the horizontal and vertical distance between the images. When a colored glass was placed before either eye the outer and higher image was seen by the covered eye. When the object, usually a thermometer case or lighted candle, was carried high above the head, the two images gradually coalesced, and the object looked very much thinner, "like a thread." With well-developed diplopia there is impaired movement of the eyeball, chiefly affecting, as far as we could ascertain, the external and internal rectus, especially the external, for the outward and inward movement of the eyeball was less free than before the action of the medicine. The ball appears to be moved by a greater effort, so that when carried as far as the weakened muscles are capable, the ball oscillates; as though the patient with a great effort moved it as far as he could, and then the tired muscles gave way a little, but being roused to an effort they carried the eye back again; the frequent repetition of this effort giving rise to an oscillation.

The external rectus is generally first affected, and not infrequently one external rectus sooner and in excess of the other. Even when the diplopia is strongly marked, the loss of power over the muscles is not very great, and there is no obvious squinting. (We may remark here that we could not detect any squinting during the transient form of diplopia.) Then, as the patient becomes still more affected, ptosis supervenes, and a great part or the whole of the upper half of the field of vision is cut off. The loss of power in the eye muscles is then more marked, but without the occurrence of obvious squinting. At this time the symptoms no longer follow the order previously described, but assume various phases, often changing rapidly. Thus, whilst on one side the outer image is the higher, if the object is carried to the other side of the field the inner image becomes the higher; or, perhaps, for the first few seconds the outer and then the inner is the higher.

We now give a series of diagrams showing the various changes of the images.

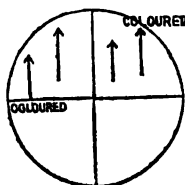
Colored glass over right eye.



Patient's left.

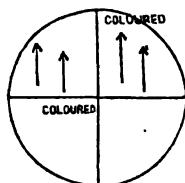
A few minutes later the images assumed the form seen in this diagram—

Colored glass over right eye.



Patient's left.

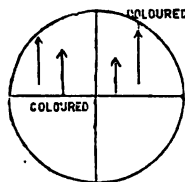
Fifty minutes later—



Colored glass over left eye.

Patient's left.

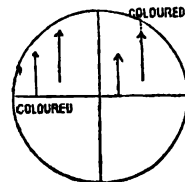
A few minutes later—



Colored glass over left eye.

Patient's left.

An hour after this—

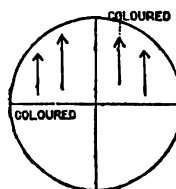


Colored glass over left eye.

Patient's left.

Just before the images assumed this form the right outer image was the higher, but in a few seconds this position was reversed—a rapid change in the relative height of the right image which happened on several occasions.

Four hours later, and six and a half hours after the last of six single-drachm doses, given hourly, when the symptoms were declining, the images assumed the subjoined form—



Colored glass over left eye.

Patient's left.

We have not ventured to test the images under toxic symptoms so marked as to weaken the legs; but apparently, after a time, objects in the lower half of the field of vision seem double; at least, two patients told us that the things on the tea-table appeared double. In almost every case the two images were parallel; that is to say, they did not converge towards or diverge from each other, with the single exception of a patient who, during one of the series of observations made on him, said that the images converged at the top. The images were often unsteady, and seemed to dance.

We have submitted the foregoing notes concerning the action of gelseminum on the eyes to Mr. John Tweedy, who has kindly consented to give an explanation of the phenomena.

#### INFLUENCE ON THE EYES.

In one of our experiments we noticed that the eyes of a rabbit became very prominent after

poisoning with the liquid extract of gelseminum. On another occasion we dropped into the eye of a rabbit a solution of the alkaloid prepared by Mr. Gerrard, containing one grain in twenty minims of water, when, to our surprise, the animal died of asphyxia, from absorption of the poison. In this animal, too, the eyes became very prominent, especially the one into which the poison had been dropped. We six times verified this last experiment.

We then dropped the alkaloid solution into the eye of a cat, repeating the application five times in an hour and a half. But though we caused the pupil to dilate widely, still we produced no general effects, whence it appears either that the conjunctiva of cats absorbs less actively than that of rabbits, or that the drug affects rabbits more easily than cats. We believe that rabbits are more susceptible than cats, for we put a large quantity into a cat's eye, causing a free discharge from the eyes and nose, which no doubt washed away much of the alkaloid, though enough remained to dilate the pupil widely. Moreover the cat licked its lips, and must thus have swallowed the washed-away alkaloid; yet, in spite of this, the animal remained unaffected. At the end of two hours we injected into the subcutaneous tissue of the back, in two places, thirty minims of the liquid extract, and in eighteen minutes respiration began to be affected. Though prior to this symptom we had noticed that both eyes were prominent, especially the one operated on, as asphyxia progressed the eyes grew more and more prominent and staring, the poisoned eye always bulging most.

As death from gelseminum is due to asphyxia, we thought that possibly the prominence of the eyes was due to congestion of the orbit forcing out the eyeballs. To ascertain the effects of asphyxia we injected into the subcutaneous tissue of the axilla of a rabbit weighing 1930 grammes six grains of chloral, and having rendered the animal insensible, we then exposed the trachea, and, by means of a pair of forceps, produced gradual fatal asphyxia, and the eyeballs were unaffected by the experiment.

We next tried a different way of producing asphyxia. After making a rabbit insensible by the subcutaneous injection of six grains of chloral into the connective tissue of the axilla, we laid bare the trachea, and introduced a glass cannula. Connecting it with an elastic bag so as to allow the animal to expire into, and inspire out of, this receptacle, thus producing a modified slow asphyxia without mechanical arrest of the respiratory movement, we produced asphyxia on three occasions, in six, seven, and nine minutes respectively. Twice, when the animal had ceased breathing, we restored respiration artificially, but on the third occasion we allowed it to die. At the very climax of the asphyxia, during the last few gasps, the eyes became a little prominent, but the slight bulging soon subsided on restoring the animal. The prominence showed far less than under gelseminum poisoning, and came on much later; under the poison, indeed, the prominence occurs before asphyxia sets in, and becomes marked as soon as this commences.

Moreover, the following experiment conclusively shows that the bulging is not due to asphyxia. We chloralised an animal to insensibility, then opened the trachea, introduced a cannula, and, having injected thirty minims of the liquid extract

under the skin, the eyes soon grew prominent, growing more so as the paralysis became general, though the artificial respiration prevented any asphyxia, as evidenced by the mucous membrane of the lips and mouth maintaining its natural color.

Therefore we conclude that the bulging after poisoning by gelseminum is due, if at all, only in a slight degree to the state of asphyxia. If not due to asphyxia, then the bulging must be referable to paralysis of the orbital muscles, induced by gelseminum; still the congestion due to the asphyxia may exercise a certain slight influence. Thus the recti and other muscles are paralysed by the effect of the gelseminum on the nervous system, but this of itself would not be sufficient to account for the prominence of the eyeballs. Could the congestion from asphyxia produce the protrusion of the eyes after the paralysis? To ascertain the validity of this view, we injected into the loose subcutaneous tissue of the axilla of a rabbit weighing 1885 grammes a solution containing six grains of chloral, and when the animal became unconscious, we laid bare the trachea, made into it a V-shaped incision, and introduced a glass cannula, so that when required we could promptly employ artificial respiration. Then we dropped into the right eye three drops of the solution of the gelseminum alkaloid; as in a quarter of an hour it had produced no effect, we introduced two more drops, and in five minutes two more, and soon after this third dose we noticed that the right pupil was a little larger than the left, and the right eyeball a little more prominent than the left; whilst at this time evidence of slight general paralysis simultaneously set in, and the breathing became a little affected. As respiration became more affected both eyes stood out prominent and staring, especially the right, whilst the right pupil grew much larger than the left, even double its size. On making the animal struggle, and thereby increasing the congestion of the head, the eyes became very prominent; then, after a few seconds' quiet, the eyes again receded into the sockets. Soon the asphyxia caused convulsions, when both eyes became very prominent, the right much the more so; and now both pupils were widely dilated, especially the right. When respiration had quite ceased, we performed artificial respiration, and as the lividity of the lips, tongue, and mucous membrane of the mouth grew less the eyeballs again partially receded, but the right still continued the most prominent. We then stopped artificial respiration, and the animal not having recovered from the effects of the drug, respiration was very languidly performed, and at last ceased, and again asphyxia ensued. The eyeballs grew prominent, and became especially so on the occurrence of convulsions, the right eye bulging much more than the left. On resuming artificial respiration, the eyeballs again receded. We several times allowed asphyxia to ensue, always with the effect of inducing great prominence of the eyeballs, especially of the right. The effect of the gelseminum and of the asphyxia respectively was well exemplified in this wise. On looking down over the head of the poisoned animal, we noticed first that the right eye was a little more prominent, though both eyeballs were concealed by the upper eyelids. When asphyxia appeared the eyeballs became visible beyond the eyelids, and bulged very prominently as the asphyxia advanced and convulsions ensued, the right ball being always the most prominent.

On employing artificial respiration the eyeballs again gradually receded into their sockets till they became once more concealed by the upper eyelids. We several times repeated this observation.

We have seen that simple asphyxia will cause very little prominence of the eyeballs, therefore most of the bulging must be due to the gelseminum; still, as the prominence was most marked when the asphyxia was at its height, and disappeared when the asphyxia declined, it is evident that this condition played a part in the production of the bulging. The following, we believe, is the true explanation. Gelseminum paralyses the muscles of the eyeballs, and hence the eyeballs become a little more prominent; asphyxia supervenes, causes congestion of the head and then of the orbit, and as the muscles of this part are more or less paralysed, the congestion of the vessels forces out the eyeball. Convulsions increase the congestion, and so contribute to the prominence of the eyes. Artificial respiration removes the congestion, and the eyeballs regain their natural position.

The influence of congestion on the prominence of the eyeballs is shown in the following way:—On poisoning a rabbit with gelseminum the eyes as usual became prominent after asphyxia had set in, and on cutting the throat immediately after death, as the blood flowed freely, lessening the congestion of the brain, the eyes fell back into their usual position in their sockets. Again, during the stage of prominence the eyeballs recede a little during inspiration and again protrude during expiration. During inspiration, blood is drawn into the chest, thus lessening the cerebral congestion, and at the same time the eyes fall in a little; whilst during expiration, the blood accumulates in the head, the orbits become more congested, and the eyes more prominent.

Where the poisoning was slow, or where death from asphyxia was prevented by artificial respiration, we found that a time arrived when the eyes either did not become prominent, or but little so, even after struggling, although the respiration was very languid. At this time the heart's beats were very much reduced in force and frequency, and were irregular and intermittent. Hence the circulation was feeble, and little blood being propelled, there would consequently be but little congestion from asphyxia, struggling, or convulsions, and thus the eyes would not become so prominent as when the heart beat vigorously.

Is this paralysis of the muscles of the eyeball part of the general paralysis, or are these muscles early and especially affected? We believe that the poison has an especial action on the eye muscles: for—(1) In man the eye is the first part attacked; (2) the prominence of the poisoned eye takes place before any general paralysis occurs; (3) when the eyes were very prominent, the animal could still quickly shut its eyelids, showing at least that the motor muscles of the eyeball are affected before and to a greater extent than the orbicular muscle.

Does the poison affect the muscles of the eye, the nerves supplying them, or the centre of these nerves? The muscles themselves are not affected, for after death by poisoning we find that under galvanic stimulation they will contract as energetically as the muscles of an unpoisoned animal. We believe the nerves are affected, and we found this opinion on the fact that the eye to which the poison has been applied protrudes first, and is al-

ways the most prominent. If the poison were absorbed and acted on the centre of the motor nerves of the eye, both eyeballs would be equally affected; but, on the contrary, as we have said, the poisoned eye always bulges more than the other, whence we conclude that it is probable gelseminum poisons the terminations of the motor nerves of the eye, though the centre of these nerves may be also affected.

We tried to ascertain if the nerves of the poisoned eye were more depressed than those of its fellow. Immediately after death we opened the skull, removed the brain, exposed the third nerve leading to each orbit, and applied electricity. Each nerve, so far as we could ascertain, conducted the current; hence the paralysis was far from complete, and there seemed no marked difference between their conductivity. This experiment is very difficult to manage, and is not very trustworthy; for the nerves of warm-blooded animals, after death, soon cease to conduct impressions, and they are quickly exhausted by electricity. Moreover, we should not expect to find any decided, or perhaps any detectable, difference between the two nerves, since both were paralysed, both eyes being prominent, though the poisoned eye bulged most. Again, as sufficient poison was taken up to paralyse the respiratory centre, enough was likewise absorbed to paralyse the nerves of the opposite eye; hence we could hardly expect any obvious difference in the conductivity of the two nerves.

The interesting effects from the local application to the rabbit's eye led us (skilfully helped by Mr. Pearse on this as on many other occasions) to try the drug on two men. We dropped into the eye of each patient two drops of the alkaloid solution every hour for eight hours. The pupils in an hour and a half became very widely dilated. After the fourth application, one man complained of slight frontal headache and some giddiness, subsequent doses being followed by slight temporary frontal headache. In spite of this prolonged action we failed to produce any decided prominence of the poisoned eye. Several who saw the man thought the trial eye was a little the more prominent, but we were at the best doubtful on this point. We produced no paralysis of the muscles, as shown by the absence of diplopia, and the poisoned eye moved in every direction as well as its fellow. The man suffered from a violent cough, and during a paroxysm his face became much congested; yet even then the poisoned eye did not protrude. Thus we did not get any topical action on the terminations of the third nerve, though in each case the absorption of the poison was made manifest by the widely dilated pupil, and the giddiness and headache which seized the patient.

These experiments prove that gelseminum partially paralyses the nerves of the orbits, affecting the terminations before the trunks of the nerves; and our observations on man further show that it paralyses the sixth nerve first, for the external rectus is weakened before the other muscles, and that afterwards it affects the third nerve, for the inward, upward, and downward movements of the eye are impaired, and ptosis is often marked.

(To be continued.)



## ON BORACIC ACID AS AN ORDINARY DRESSING FOR WOUNDS.

By LEONARD CANE, M.D., B.S. Lond.,

Consulting Surgeon to the Peterborough General Infirmary.

THE use of boracic acid and the different preparations containing it has been introduced as part of the antiseptic system, and its advantages have been well dwelt upon by Professor Lister, Mr. Godlee, and others. But it is as a *simple* dressing for wounds of all kinds, altogether apart from the antiseptic system, strictly so called, that I wish to draw attention to it.

However great the advantages of Mr. Lister's method of dressing wounds, it is undoubtedly felt by the great majority of surgeons, especially those engaged in private practice and whose time is often limited, that the details and the time required for their proper performance, *practically* prevent its use in all ordinary cases. In hospital practice, where skilled assistance is always at hand, and in the higher class of purely surgical practice, I believe that the antiseptic mode of dressing wounds is by far the best. But we want something which, while it has to a certain extent the merits, yet is without those tedious details, and which can readily be performed by anyone without assistance.

The preparations of boracic acid have now been rather extensively tried by me for some months, and in all the cases in which they have been used the results have been good, and decidedly better than under the ordinary methods of dressing. The most convenient forms for use are the boracic (boric) lint and cotton wool, a concentrated watery solution of the acid, and boracic ointment. Boracic lint is prepared by soaking lint in a saturated *boiling* solution of the acid. On drying the lint a copious deposit of fine flaky crystals takes place between its fibres. Cotton wool may be similarly served, and when dried and carefully picked out forms a very useful dressing. The concentrated solution is made by dissolving the acid in boiling water to saturation. The ointment is made by rubbing down one drachm of the acid with one ounce of simple ointment, or benzoated lard.

Boracic acid, unlike most antiseptic agents, is bland and unirritating; and, whilst its non-volatility renders it less useful in some cases than carbolic acid, its great superiority to this and to chloride of zinc resides in its unirritating nature. The boracic lint is best used as a dry dressing, and for recent wounds where simplicity is desired it has no equal. A pad of lint applied immediately over the wound, and kept in place by pieces of strapping, is all that is required, and union by first intention is a common result.

The following cases will illustrate its application to this kind of wound.

An elderly gentleman was drawing the cork of a wine bottle and applying considerable force when the shoulder of the bottle broke in his hand, and he received a jagged wound obliquely across the palm of the left hand, extending from the ulnar side of the wrist to the cleft between the thumb and forefinger. Considerable bleeding took place and several small arteries were wounded, but the hæmorrhage was temporarily stopped by tightly binding up the hand and wrist. The wound was gently bathed with some boracic lotion and brought

together by three silver-wire sutures. A long pad of boracic lint, about four folds thick, was then placed over the wound and firmly strapped down by plaster. The whole hand was then firmly bandaged. On the third day the pad was removed. There had been some bleeding; there was very little swelling of the hand, and no offensive smell to be detected. On taking off the pad the wound was seen to have united at its extremities, where it was more cleanly cut, and at the deepest and most irregular part it was looking healthy. There was a little suppuration, but no odor of putrefaction. The stitches were taken out and the hand dressed as before. On the sixth day the dressings were again undone, and the wound was then found to have entirely healed except about half an inch of its length, which had become superficial and was covered with a whitish glairy discharge; there was no fetor or evident suppuration. The dressings were reapplied, and on the ninth day were removed altogether, the wound having completely healed, leaving a firm cicatrix. This case illustrates the simplicity of the method, for with a severe wound, four inches long, nothing further was required than three simple dressings.

J. B—, aged twenty, laborer, was knocked down by the wheel of a thrashing machine and received a severe wound on the outer side of the left knee, part of the wheel passing over the side of the knee. On examination I found a contused wound, the surface of which was almost reduced to a pulp, and measuring about two inches across in any direction, whilst in the centre it was half an inch deep. There was some swelling of the knee-joint, which had come on very rapidly, but beyond this no injury to the joint itself could be detected. The trousers over the knee had been torn, and the wound was very dirty. It was not bleeding to any extent. I first washed out the wound with some boracic lotion, pouring it from a height in a gentle stream, so as to remove the particles of dirt, &c., then applied a pad of boracic lint several folds thick, and placing a splint behind the knee to keep it at rest, firmly fixed the whole with a bandage. On the following day the dressings were removed. There had been a great amount of discharge, and the dressings were soaked with it. The discharge consisted of pus and debris from the wound, and was decidedly putrefactive. There was considerable inflammation round the wound, and the knee was swollen and so painful that the patient could not sleep. The wound was well washed out with boracic lotion, and the pad applied as before. Dressings taken off next day; swelling, pain, and redness less marked; discharge still profuse, but no longer fetid. Dressed as before. For the next three days the wound was dressed daily and made steady progress; after this at intervals of three days for a fortnight, during which it granulated and cicatrised, forming a good cicatrix. For the latter part of the time the patient dressed the wound himself, simply applying a piece of boracic lint.

In cases of phlegmonous erysipelas, where sloughing takes place, the boracic lotion appears to have a very beneficial effect, and to stop further spread of the mischief. The following case illustrates its use.

A. M—, aged fifty-six, female, who had suffered from ulcers on the leg some years previously, was taken suddenly ill with rigors, vomiting, and fever, without any apparent cause beyond

"catching cold." She lived in the country; had not been where there was any illness, and had not received any wound or injury. She took to her bed at once, and complained of severe pain on the outer side of the left instep and up the calf of the leg. In the course of a few hours the leg swelled to a great extent, and was intensely painful. Patient became delirious, and her temperature and pulse ran up quickly. The leg soon became brilliantly red and extremely painful and tender. On the third day the swelling about the foot felt "boggy," but there was no fluctuation to indicate any circumscribed collection of matter. Large blebs formed on the surface of the instep and ankle. The next day a patch, five inches long by two and a half inches broad, appeared on the outer side of the foot, paler than the surrounding skin, of a yellowish marbled color, and evidently about to slough. No deep fluctuation could be found anywhere, and it was not thought advisable to make any incisions. The skin over the patch gave way on the following day, and the sloughing process appeared to be rapidly extending. The whole leg was very much inflamed and swollen, and red lines, following the course of the lymphatics, were seen on the thigh. Up to the present time the chief treatment had been fomentations to the leg, while nourishment in every available shape was given to the woman. The erysipelatous state appearing to spread, and a large slough having made its appearance on the inner side of the foot just below the ankle, the whole leg and foot were ordered to be bathed at frequent intervals with a warm solution of boracic acid, and the foot to be kept constantly wrapped in linen cloths wetted with the same. Liberal support, with quinine and perchloride of iron, to be continued as before. The next day there was some improvement: the inflamed lymphatics upon the thigh were less tender; the redness of the foot and leg had somewhat diminished; the sloughing had not extended. Dressed as before. In the course of the next two days the swelling of the leg and foot decreased; the large slough on the outer side of the foot became surrounded by a line of demarcation and began to separate. No extension of the disease had taken place, and the patient had decidedly improved in her general symptoms. The sloughs separated in the course of a week, leaving a large surface about one-third of an inch deep, which suppurated freely, but was without any odor of putrefaction. Patient expressed herself as greatly relieved by the lotion, and said that during the night, if not dressed for a few hours, it became much more painful. From this time the large wounds gradually, and without any interruption, healed. The granulations were healthy and the discharge comparatively slight. The whole of both wounds cicatrised well, and patient entirely recovered the use of her limb, though with some stiffness.

In this case the effect of the antiseptic on the spread of the erysipelatous inflammation was very evident, and the whole progress of the case fully bore out the advantages which were expected from the boracic acid.

As a simple dressing for old ulcers of the leg the boracic lotion and lint are cleanly, and the healing processes go on favorably under its use, sometimes succeeding when other applications have failed.

J. G—, aged thirty-six, had large deep ulcers which followed her confinement two years ago.

They were situated on the inner side of the ankle and below the knee. She was ordered to rest her leg up, and was given liberal diet; whilst the wounds were dressed with sulphate-of-zinc lotion ("red wash") for some weeks. Under this treatment they improved slowly, but not very satisfactorily. The dressings became fetid occasionally from neglect, and for some weeks the ulcers got better and worse alternately. The ulcers were accordingly well washed with boracic lotion every morning, and afterwards covered with boracic lint. Under this treatment a marked change occurred; the ulcers became clean, lost all their fetor, and were completely healed in three weeks' time.

In skin-grafting the boracic acid is very useful. I have found the following plan answer best:—The surface to which it is intended to apply the grafts is first well cleaned by applying the boracic lotion for some days, till the discharge is perfectly free from putrefactive odor. The skin from which it is intended to take the grafts is also well washed with the lotion. Small portions of the skin are then removed, and applied to the raw surface in the usual way. I then protect the grafts by a strip of gutta-percha tissue dipped in the boracic lotion, and over all apply a piece of boracic lint. Under this plan the grafting is very successful, and gives very little trouble. The following case will illustrate the method:—

A. P—, aged thirty-six, domestic servant, applied on account of a large varicose ulcer on the leg. The ulcer was of old standing, and had broken out and healed over several times before. When first seen it measured about two inches in all directions. It had raised and indurated edges. The floor of the ulcer was dark purple, and the granulations were unhealthy. The skin round the ulcer was dark and congested. Patient had worn a bandage for some time, and could apply it evenly. The ulcer was first well washed with boracic lotion, covered with boracic lint, and then the leg was well strapped from the ankle to above the ulcer. Patient was given some boracic lotion, with orders to remove the strapping after three days, and then apply linen rags twice a day wet with the lotion. At the expiration of a fortnight she came again. The wound was much healthier in appearance. The edges were reduced and less prominent. The granulations were redder, and the discharge less, and quite inodorous. Five grafts were now applied to the ulcer, the skin being taken from the woman's arm, and the whole dressed as described above. When next seen (ten days afterwards) the wound had lessened in size to the diameter of an inch. Three of the grafts had grown considerably, and one had joined the edge of the ulcer. The wound looked healthy, though patient had been obliged to walk about considerably. There was now very little pain. She continued to apply the lotion once a day, and the wound completely healed in a short time.

This case shows how little trouble the dressing gives. After the grafts were applied the patient had to walk away from my residence. She was unable to rest up, and could only apply the lotion once a day. Yet with this little attention it made steady progress, and patient was more free from pain than she had been for months.

For boils on the neck and elsewhere the boracic lint is an excellent application; a piece large enough to hide the boil, and covered with a piece

of gutta-percha tissue, often gives great relief. For carbuncles and other cases in which it is desired to apply a poultice, I have found the new "instantaneous poultice," prepared from Iceland moss by Messrs. Rigollet, a capital and efficient remedy. The poultice should be prepared by soaking it for a short time in the boracic lotion, and when applied should be covered with gutta-percha tissue.

Lastly, in some of the vegetable parasitic diseases, such as pityriasis versicolor, tinea circinata, &c., the boracic lotion and ointment will often be found serviceable.

Briefly to sum up the advantages of boracic acid:—

1. It is an *antiseptic which does not irritate and inflame*, and so allows the natural processes of healing to go on without much interruption.

2. It is exceedingly *simple* in its application, and can be used apart from all the details required by a thoroughly antiseptic method.

3. It can be used in the shape of the lint, lotion, cotton-wool, &c., in combination with most other methods of treatment.

4. Its *cost is trifling*; and though this is of secondary importance, it is a feature of the treatment which will recommend its employment in workhouse infirmaries and in dispensary and parish practice.

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## NOTES ON UTERINE PATHOLOGY.

By GRAILY HEWITT, M.D., F.R.C.P.

### I.

THE system of uterine pathology which was put forward in the third edition of my work "On Diseases of Women" (1872) was embodied in the following proposition:—"(a) Patients suffering from symptoms of uterine inflammation (or, more properly, from symptoms referable to the uterus) are almost universally found to be affected with flexion or alterations in the shape of the uterus of easily recognised character, but varying in degree. (b) The change in the form and shape of the uterus is frequently brought about in consequence of the tissues of the uterus being previously in a state of unusual softness, or what may be often correctly designated as chronic inflammation. (c) The flexion once produced is not only liable to perpetuated itself, so to speak, but continues to act incessantly as the cause of the chronic inflammation present." (p. 2.)

Many of those who have criticised my views on the subject have imputed to me opinions which I have never held. The views to which I have committed myself were concisely represented in the above-quoted passage. To that expression of opinion I still adhere. This conclusion was not expressed hurriedly, but deliberately, and was based on an accumulation of facts and observations made publicly, recorded publicly, and the accuracy of which has never been arraigned. Experience before and since that period has only confirmed me in the above opinion, and clinical observation—the final court of appeal in such a matter—has more and more convinced me of the

substantial accuracy of this view of uterine pathology.

Uterine pathologists have been reproached for the apparently opposing views they hold on the subject, but those conversant with the details of gynecological practice are aware that generalisation in regard to this subject is one beset with difficulties. Moreover, systems have their "day," and the adherents of one system are often not ready to admit that a better system is possible.

It is natural enough that those who have been long accustomed to regard "chronic inflammation" of the uterus as the chief clinical feature in the cases coming under their notice, and who have been in the habit of attempting to relieve their patients, and frequently successfully, by measures calculated to lessen the "chronic inflammation," should be reluctant to admit that there is something extremely important underlying this "chronic inflammation," which they have either altogether ignored or treated as a secondary and unimportant condition.

The opposers of the new doctrine may be classed under two heads:—1. Those who know little as to the actual frequency of alterations of shape of the uterus as a clinical fact. These comprise at this date comparatively few. 2. Those who admit the frequency with which alterations of shape of the uterus occur, but who contend that these alterations of shape are never of any consequence *unless associated with* "chronic inflammation," or, as some prefer to call it, "congestion." The authors of repute whose opinions are concisely represented in this second category are numerous. They represent a kind of compromise between the old and the new view of the subject, and as it is not rarely the case in human affairs that compromises are acceptable to public opinion, this compromise is largely accepted.

Of late a knowledge of the existence and frequency of occurrence of flexion of the uterus has been largely extending; many new investigators have entered the field, and numberless contributions have been published within the last four or five years, evidencing the importance with which these alterations of the uterus are regarded by the rising generation of gynecologists. It will not be necessary, therefore, to deal with those opponents classed under the first head. The compromise theory, as I would term it, is practically the one admitting of discussion of an advantageous kind.

In the first place I would remark that we have here to deal with (a) facts admitted (b) opinions controverted.

a. The facts admitted are that in many cases, a large proportion of actual cases indeed, the patient is found to have (1) a distorted condition of the uterus, and (2) a congested, or inflamed, or softened (these terms are convertible, or sufficiently so for the sake of argument) sometimes a hardened condition of the uterus.

b. One, and the most important, of the opinions controverted refers to the *connexion which subsists* between the two things.

It may be possible to reconcile to a certain extent the apparent conflict of opinion on this matter.

The discomfort the patient experiences is due to what? Here is the point where a difference of opinion begins. The opponents of the new theory, some of them at least, boldly state that flexion by

itself produces no symptoms, and that when it is associated with "chronic inflammation, congestion, softening," &c., it is the latter condition which gives rise to the discomfort.

Unquestionably the "other condition" of the uterus, call it by what name you will, is largely responsible for the pain, discomfort, &c., in those cases where it and the flexion are associated. So far there is a certain amount of agreement. I have never disputed the importance of this "other condition" of the uterus; indeed, I attach an extreme degree of importance to it. But the relation which subsists between flexion and this "other condition" (I use this phrase, "other condition," because it is troublesome and calculated to mislead to perpetually employ terms which imply some particular ideas as to the nature of this "other condition") is the point on which we differ very materially.

So far as I am aware, no comprehensive attempt has been made by the upholders of the compromise theory to explain how and why it is that the uterus becomes affected with the "other condition." I do not know that any attempt at all has been made. The only substantial criticism which has been made on the theory which I have put forward as to its cause is to the effect that patients are relieved by treating the congestion alone, and without paying particular attention to the deformity of the uterus. Further, it is contended by some that relieving the congestion cures the deformity. But admitting the fact that the application of leeches, for instance, to the os uteri relieves the patient of pain, and admitting further that unloading the uterine vascular system of its superfluous blood in some cases facilitates its return to the normal shape, these admissions are very far from invalidating the truth of the propositions above quoted as embodying my views.

My own practice has been to deal with cases, where the two things are associated, on the principle that the change of shape is the principal cause of the other alterations in the uterus; and I am able to affirm that this principle is one which is practically and almost always successful in relieving patients of their suffering. When I am told, therefore, that another method—the continuous depleting treatment, as it may be termed—is efficacious, my reply is, "Possibly; but my method is more rational, goes more completely to the root of the matter, and it succeeds."

I have insisted on the clinical importance of the flexion as compared with the other condition, because I consider it to be the *fons et origo mali*, so far as the suffering is concerned. The facts supporting this view are conclusive to my mind. They are briefly these: that exertion and bodily exercise, even bodily position, which tends in any way, for the moment, to aggravate and intensify the existing flexion, gives rise to increase of pain. Nay, many of these sufferers *only* suffer when taking these exercises, or when so sitting or so standing as to bring forces into action calculated to still further strain and bend the uterus, and thereby intensify the other secondary effects.

The "mechanical" theory of uterine pathology, which I have endeavored to develop in the third edition of my work, does not consist, as seems to have been imagined by some of my critics, in the application of instruments in all cases. The word "mechanical" is used in another sense altogether, and is intended to imply the mechanical origin of the uterine disorder. The mechanical theory of

uterine pathology is a common sense explanation of what is found to occur in the uterus when the patient suffers from symptoms referable to it. The essence of it is that the circulation in the uterus is necessarily impaired, obstructed, and interfered with when the organ is constricted at its middle portion, which is the case in patients affected with flexion of the uterus. There ensues a congestion of both extremities of the uterus, the occurrence of which is a necessary result of compression of the vessels and tissues at the centre, and which I some few years ago described in its

The woodcut represents diagrammatically congestion (strangulation) of the uterus consequent on acute bending of the organ, the parts deeply shaded representing those parts of the uterus swollen and unduly loaded with blood.

most intense degree as a "strangulation" of the uterus. Klob, in his work on the Pathology of the Female Sexual Organs, speaks of this effect. Dr. Thomas, of New York, whose views on the subject of uterine pathology are, in many essential particulars, identical with my own, also recognises this effect of flexion of the uterus in inducing congestion of the fundus and os uteri. Dr. John Williams, in a recent valuable paper, admits this mechanical result of flexion in producing congestion of the organ.

When flexion occurs, then, there results "mechanically" a congestion as above described. When the flexion is intensified the congestion is increased; when it is removed or lessened the congestion is relieved. To unbend the uterus is to permit the circulation again to resume its normal course and its natural freedom. The flexion thus acts (as indicated in the third of the three propositions above quoted) incessantly in keeping up the so-called "inflammation."

We come next to the *causation of the flexion*. Here again my statements have been much misrepresented or misunderstood. Without pretending at this moment to answer this question exhaustively, it may be said to originate in one of two ways: either, as indicated in the second of my original propositions, "in consequence of the tissues of the uterus being previously in a state of unusual softness, or what may be often correctly designated as chronic inflammation"; or, as I have stated in another place, in consequence of a sudden fall, or shake, or blow.

This view involves, it will be observed, an admission as to the share played in the etiology of flexion by certain other conjoined conditions of the uterus itself, which is very explicit and well de-

finer; this part of the question has yet to be more fully developed. It is, however, quite certain that in many cases the quite healthy uterus becomes suddenly affected with flexion by accident, or force applied to it in some way. And it must be evident that these two classes of cases will have each a different history. Here again may be pointed out certain points on which agreement really holds good. Both sides admit the concurrence of changes in the uterus (so-called inflammation, congestion, softness, &c.) and flexion of the organ, and also the occasional occurrence of acute flexion from the action of an external mechanical force.

Now I would inquire of those who are opposed to the theory I uphold, how they will explain the occurrence of congestion, chronic inflammation, &c., as secondary phenomena of acute traumatic flexion otherwise than in the manner I have endeavored to explain it. If they admit, as inferentially seems to be the case, that a decided flexion may suddenly occur and be followed by the events referred to, how are these latter explainable in any other way? It appears to me likely that on reflection this point would be conceded, and that concerning this class of cases there would not remain much difference of opinion.

The real difficulty develops itself when we come to endeavor to explain those cases where the flexion is one of some standing, its mode of origin not decidedly and pointedly indicated by the previous history, and conjoined therewith are found various alterations of the uterine tissues, also evidently of some standing.

I have thus far endeavored, as fairly and accurately as I could, to reach the source of a part of the disagreement which exists.

It may be added to what has been stated, and as a convenient way of putting the matter concisely:—

1. There are conditions of the tissues of the uterus (congestion, chronic inflammation, softening, hardening, &c.) which may be present without flexion or change of *shape* of the uterus.

2. There are like conditions *coexisting with flexion* of the organ.

3. The tissues of the uterus are, with some few qualifications, in a like condition in the two cases.

4. The "other condition" may have existed prior to the occurrence of the flexion.

5. The "other condition" may be produced, originated, and maintained by the presence of the flexion.

The further elucidation of the important questions still matters of controversy requires, in my opinion, careful consideration. I shall hope to carry the matter further in subsequent communications.

#### EXPLANATORY REMARKS ON THE TREATMENT OF STRICTURE OF THE URETHRA AND GLEET.

By F. A. OTIS, M.D.,

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Among the many valued professional courtesies extended to me during a brief stay in Great Britain

last summer, none was more esteemed than that which proffered me the opportunity of fairly presenting to the medical profession in England my somewhat peculiar views in relation to some points in urethral surgery. Through the invitation of Mr. Berkeley Hill, Professor in the University College of London, and by the aid of the clinical material kindly placed at my disposal by him, I was enabled to do this, in a lecture at the University College, under circumstances every way favorable and agreeable to me.

The recent vigorous yet friendly analysis of this lecture by Mr. Hill, together with a summary of fifteen cases of urethral stricture, operated on by him according to my method, and reported in *THE LANCET* for June, is just received. I desire the privilege of correcting, through the same influential medium, some important misapprehensions of my views and methods of procedure; and also to answer some objections made on points of special interest to all concerned in the progress of urethral surgery.

Mr. Hill has formulated my innovations upon the usually accepted views, as follows:—

"1. The human urethra varies much in its calibre in different persons.

"2. The urethra is much wider than is usually taught.

"3. The meatus urinarius is normally as wide as the rest of the canal.

"4. Gleet is always due to stricture.

"5. In the term stricture Dr. Otis includes those early indurations which have not sufficiently advanced to interfere with the passage of urine, or to produce any symptom beyond a discharge. But he maintains them to be really bands of contractile-tissue fibres, produced by inflammatory action.

"6. Stricture is most frequent in the first inch from the meatus, and is less frequent as the distance from the entry increases.

"7. Complete division of stricture and maintenance of the incised part at its natural width until the incision is thoroughly healed prevents return of the contraction, and, moreover, *causes absorption of the indurated tissue from the affected part.*"

In the first place, let me pay a merited tribute to the ability, fairness, and kindness with which Mr. Hill has considered questions involving so radical a departure from the time-honored teachings of authorities.

In regard to the first proposition, Mr. Hill frankly admits that "the urethra varies in calibre in different individuals. Considering," he fully remarks, "that the penis also varies, this might be well presumed *a priori.*" He thus rejects the assumption of a fixed standard, which he states is usually set at 12 of the English scale.

This conclusion is arrived at after the careful measurement of ninety-five urethrae, and fully confirms my claim that no intelligent diagnosis of the number, calibre, or extent of stricture, in any individual, can be made while the assumption of a fixed standard is admitted.

In this connexion Sir Henry Thompson is quoted as saying that "the urethra is not a tube at all except when some body is passing along it," and defines it to be a "closed valvular chink."

I am unable to attach any importance to the objection that the urethra is not a *tube* because it is a closed tube when not distended. It might with

more reason be objected that the *chink*, being an *aperture* or a *crevice*, when closed, ceases to exist, and hence, notwithstanding its valvular attachment, would fail to convey any correct idea of the urethra. Mr. Hill, however, in a very masterly paragraph, has presented the practical aspect of the urethra, independently of appellatives, by showing the necessity of ascertaining to what extent a given urethra should be capable of being normally distended. He says: "If the balance between the natural expulsive force of the bladder and the friction along the urethra is disturbed, the bladder is irritated, the kidneys are affected, and the beginning of the long chain of events, which terminate not unfrequently in death, is made."

How, then, is this most important *balance* usually disturbed? Not by that most patient of all asses, *the bladder*, habitually doing more work more quietly and with less consideration than any other organ of the body, but by *the urethra*—sensitive, easily and frequently irritated, inflamed from various causes, and finally strictured to a greater or less degree. This it is that "increases the friction and disturbs the balance." Hence it becomes a matter of first importance to ascertain, at as early a period as is possible, the normal calibre of every urethra in which symptoms of *undue friction* are present, in order to ascertain the *amount* of constriction which has occurred. Thus, the *least* appreciable encroachments become worthy of attention, and hence we have reason for including, under the term *stricture*, "those early indurations which have not sufficiently advanced to interfere (markedly) with the passage of urine, or to produce any symptom beyond a discharge" (point 5th), and these are readily and with precision made out by means of the urethrometer and the bulbous sounds which Mr. Hill has illustrated and described.

The assertion that "gleet is always due to stricture" (point 4th) finds corroboration in the known facts, that *constriction* always *increases friction*; that increased friction causes irritation; and that continued irritation of mucous membrane, anywhere, often produces and always prolongs a mucous or muco-purulent discharge. This then is my defence for considering the slightest encroachments upon the normal urethral calibre worthy of consideration and treatment. I have stated it as my opinion that "gleet is always due to stricture," yet I do not mean to be understood as claiming that division of stricture always cures gleet. Inflammation of the eye, as a rule, always results upon the presence of a foreign body in it, and yet it is quite conceivable that the diseased action, originally set up by the presence of the foreign body, may not be entirely removed by the removal of the first cause; yet no one will deny that it is wise surgery, in every case (when it is possible), to remove the foreign body. Gleet may continue after the removal of its cause; the inflammatory action, long continued, may have spread to the continuous mucous membrane of the urethral lacunæ and sinuses, and persist in spite of the removal of stricture (or of the use of other means) indefinitely; those are exceptional and sad cases, but do not seem to me to invalidate the claim that "*as a rule gleet depends upon stricture*," or that stricture when present should be removed as the first and most rational mode of remedying the evil.

Point 3rd is an anatomical one. "The meatus

urinarius is normally as wide as the rest of the canal."

I would not be understood to mean by this that it is usually so, but that this is the highest normal type of meatus. In a paper published in the *New York Medical Journal*, April, 1874, on "Urethrotomy, External and Internal," I remarked of this correspondence that it "may be considered as the normal condition of these parts, and any variations from such uniformity may be considered aberrations from the normal condition. These (aberrations), however, are, as a rule, of no practical importance unless the tissue composing them has been previously invaded by inflammatory action." "As long as the meatus escapes inflammatory action it does not become a source of trouble on account of its diminutive proportions. Let inflammation be set up in this locality, as may occur from extension of an infantile or an adult balanitis, or from gonorrhœa, or from any other cause, and a plastic exudation results, which, becoming organised, disables the urethral muscular structure at this point, and it is no longer able to act efficiently in expelling the last drops of urine; they are retained, a dribbling results, and is the unvarying sign that such an accident has occurred. We may have a meatus from the size of a mere pin-hole to the full size of the urethra behind it, and yet find no difficulty in any case. In a recent public examination of a hundred patients in Charity and Bellevue Hospitals, claimed to be free from inflammatory antecedents, the meatus

| In 1 was 13 mm. cir. | In 17 was 25 mm. cir. |
|----------------------|-----------------------|
| 8 " 15 "             | 8 " 25½ "             |
| 1 " 16 "             | 4 " 26 "              |
| 8 " 18 "             | 5 " 27 "              |
| 2 " 17 "             | 8 " 27½ "             |
| 8 " 19 "             | 2 " 28 "              |
| 1 " 19½ "            | 1 " 28½ "             |
| 3 " 20 "             | 5 " 29 "              |
| 2 " 20½ "            | 8 " 30 "              |
| 2 " 21 "             | 5 " 32 "              |
| 5 " 22 "             | 4 " 33 "              |
| 1 " 23 "             | 2 " 33½ "             |
| 1 " 23½ "            | 2 " 34 "              |
| 7 " 24 "             | 1 " 37½ "             |
| 1 " 24½ "            |                       |

Average size in one hundred cases, 24.72.

In no case was the urethra, in the one hundred cases, below a calibre of 26 millimetres—ranging from this to 39—the average being 32.95. In none was any trouble complained of. None, then, can be strictly claimed to be abnormal as long as the functions of the part are well performed, and hence, in the presence of such great variations, it might be difficult to fix upon the *highest normal type* of the meatus urinarius. We do find, however, that various and grave difficulties and diseases are occasionally associated with a genito-urinary apparatus where the meatus is not of the full size of the urethra behind it, and that such difficulties are often promptly relieved by a surgical procedure which permanently enlarges the meatus to that size. The fact that such difficulties do not occur when the meatus is of the full size of the canal behind it, gives additional weight to the assumption that "the condition of these parts which ensures the most complete functional integrity and is least liable to become the source or seat of disease, and which is also least liable to induce, aggravate, or prolong disease in the con-

tigious parts, may be safely and appropriately accepted as representing the *highest normal type*. Of the hundred cases above reported, the meatus was found to correspond to the size of the urethra behind it in ten cases, while none exceeded that limit. In his ninety-five cases Mr. Hill found the above-named correspondence in only three cases; his examinations, however, were made in subjects who confessed to previous or present inflammatory urethral trouble. The correspondence in my own hundred cases was more than I had previously claimed, which was about one in twenty. One hundred cases is probably too few to decide, and further observations are needed to settle this point with exactness.

In regard to the calibre of the spongy portion of the urethra (point 2) Mr. Hill frankly states that his measurements of ninety-five urethrae confirm the truth of the statement that "the urethra is wider than is usually taught." He has, however, misapprehended in inferring that I consider the ante-bulbous urethra of uniform size. My observations completely coincide with Mr. Hill's that at the bulbous part the urethra is the widest (i. e., most distensible). From this I have found a gradual narrowing for from one to two inches, and then a calibre almost uniform to the meatus, except where this is several degrees less in size, when there would be an expansion of from a quarter of an inch to an inch behind it, at the point usually referred to as the fossa navicularis. Measured with the urethrometer, this difference between the bulbous and spongy urethra was

| In 35 cases 1 mm. | In 2 cases 6 mm.    |
|-------------------|---------------------|
| 21 " 2            | 2 " 7               |
| 18 " 3            | 1 " 11              |
| 6 " 4             | 13 " no difference. |
| 2 " 5             |                     |

The average difference in the 100 cases was 2.5-100 millimetres, and the calibre of the ante-bulbous portion averaged 32.95 mm.

(To be concluded.)

#### ON THE USE OF THE

### HYPOPHOSPHITES OF LIME AND SODA IN PHTHISIS.

By M. CHARTERIS, M.D.,

Physician and Lecturer on Clinical Medicine in the  
Glasgow Royal Infirmary.

In presenting the details of the following cases to the profession, I must premise that I advance no theory as to the mode of action of the drugs employed. I simply desire to record facts. The treatment was adopted septically and experimentally, after reading a well-known book on the subject.

The first two cases improved in so marked a manner that one was induced to go on even when they failed in others. My former and present assistants have afforded me valuable aid in obtaining the history of the hospital cases; yet the auscultatory and percussion evidences were in each hospital case ascertained by myself and then entered into the ward journal. One thing was

plain to everyone, and that was the power of the hypophosphites of checking the night-sweats, even when all treatment of a curative kind was of little avail. The drugs employed were the Pharmacopœial preparations of the hypophosphites of lime and soda, at first used alone, and afterwards, as will be observed, combined with glycerine. As will be seen, the thermometric indications were carefully recorded. I was not aware until very lately, neither do I find it recorded in the most recent works on the subject, that the temperature varies in the side affected. It would be premature as yet to mention this otherwise than incidentally, but, if confirmed by further observations, its importance as a diagnostic and prognostic is very evident. The side on which there are marked evidences of mischief has a higher temperature, in the axilla, than the side which is free from disease. In some cases this was as high as a degree, in others varying from four to six points. The difference was most apparent in the evenings, when the temperature was higher; but even in the mornings there was a slight distinction. To show that these observations are borne out by post-mortem facts, I may mention that I recently had an opportunity of inspecting the lungs of a man whose temperature indicated for the last four days, in the evening, 102° on the left side, 101° on the right; and three cavities were found in the left, none in the right lung. In the cases at present to be recorded I was not aware of this. The temperature was taken in either axilla.

The first case in which I employed the hypophosphites was that of E. M—, aged thirty-eight. She was admitted into the Royal Infirmary on March 27th, 1875. She stated that she had had a cough every winter, but this attracted little attention until five months ago, when she had what she termed "inflammation of the lungs." This phrase in Scotland has a wide significance, and may mean anything or nothing. What she complained of now was cough, spitting, and shortness of breath. She had not been "poorly" for five months, and she was so weak and exhausted that she could not move about.

On examining her chest, distinct flattening of both apices was observed. In the infraclavicular region of the left side the "cracked-pot" sound was elicited on percussion. There was also dullness in the same region, but not of the same character or extent, on the right side. In other parts of the chest the resonance was normal. On auscultation there was the usual evidence of a cavity in the left infraclavicular region, and tubular respiration in the corresponding part of the right side. The sputum was abundant, filling twice daily the usual hospital vessel for its reception. It was also distinctly unimular. Temperature 101° in the evening, and 98.5° in the morning. Bowels loose; appetite bad. Generally speaking, there was great emaciation; severe cough and profuse perspiration. She was ordered cod-liver oil, but it produced nausea and vomiting, and had to be abandoned after a trial of ten days. At this date she was very exhausted; the night-sweats were excessive; the temperature 102° in the evening; the appetite *nil*. I now ordered her the hypophosphite of lime in two-grain doses thrice daily, with little hope of any benefit. Two days after taking it she stated that the sweating had entirely disappeared, and she felt and looked brighter.

Without entering too minutely into the case, it



may be mentioned that the amendment was steady. The temperature declined, although occasionally there was an increase for three or four days, and sometimes a smart attack of diarrhoea. She remained four months in the hospital, and subsequently went to the Convalescent Home. On her coming from there she wrote to the nurse and stated "that she spat none, had no night-sweats, and was able to follow her usual occupation as a sempstress." A very important fact was also noted—the return and regular continuance of the catamenia after six weeks' use of the treatment detailed.

The next case was that of A. B—, an umbrella-maker, aged fifty. The family history was unimportant, but her present story showed that she had cough, expectoration, and general weakness for three months. Her illness had prevented her working, had reduced her to poverty, and she was thus unable to obtain proper nourishment.

On examination the thorax was emaciated, with dulness on percussion over the right supraspinous and infraclavicular space. The breathing was somewhat tubular over the whole of the same lung, but at the apex it was distinctly cavernous. The expectoration was nummular and occasionally frothy. The thermometer indicated a temperature of 100.5° in the evening, and 98° in the morning. In addition to these symptoms, it may be mentioned that there was great weakness, a feeble appetite, and very profuse night-sweats. After allowing her to remain *in statu quo* for five days, she was ordered the hypophosphite of lime in the same doses as in the previous case.

Four days afterwards, on the 22nd of April, she voluntarily stated that she felt much better than she had done for months, and that the night-sweats had disappeared. She was kept on the same treatment six weeks, and the report stated that she was "bright and cheery," and that she had gained a pound in weight since her admission.

On May 21st it was deemed advisable, for the sake of experiment, to stop the hypophosphite and try her with cod-liver oil. On May 24th patient complained of sickness, but no vomiting. She had slight sweating on the previous evening, the first time for fourteen days. On the 26th the sickness was gone, but the night-sweats were profuse. On the 27th it was considered right to order the hypophosphites again in the same doses. The treatment thus embraced hypophosphite of lime and cod-liver oil.

During the next six days the sweating continued, but in a less degree. On June 2nd the patient was much better; no night-sweating. She was weighed on this day, and found to be 8 st. 2 lb., being 6 lb. to the good.

From this date the improvement continued. She went to the Convalescent Home, and on her return from it three weeks afterwards, on August 9th, she stated "she was now perfectly well; cough, spitting, and night-sweats entirely gone; and she had resumed her occupation as an umbrella-maker."

One of the most successful cases was a private patient, A. D—, aged seventeen. The family history showed that the mother and two sisters had died of consumption, and at no stage of their illness could cod-liver oil be taken without producing nausea and vomiting, however small the dose might be. She had been kept in the house nearly six months, was rapidly losing flesh, sweating greatly at night, and in a highly nervous state

through the knowledge of the previous deaths in the family and fear that she was rapidly sinking. She had an irritable, hacking cough, without much expectoration, and, in her own words, stated "she always felt languid, lazy, and tired out, as if it would be no hardship to be in bed all day."

On examination, I found dulness on percussion on the right side, immediately below the clavicle and beside the sternum. This dulness measured transversely and perpendicularly in the former an inch, in the latter an inch and a half. There was no crepitation, but there was bronchial breathing and bronchophony. Without entering into any theoretical inquiry as to causation, there was little doubt that here was consolidation of the lung, limited in character and extent, and all the general indications of phthisis. I use her own words again, because they are plainer and pithier and freer from technicalities than any I could employ. "I sweated a good deal. I wore flannel, and sometimes it was quite damp, and my face and neck so wet that I had to dry them. I did not sleep for some hours after going to bed, and I was very feverish." This was her state when I saw her first, at the end of May. Cod-liver oil and the usual remedies had been tried and abandoned. I ordered her three grains of the hypophosphite of lime twice daily, and also to make careful thermometric observations, which were continued for two months. For the first two nights the temperature was 101° at night and 100° in the morning. For two weeks afterwards the thermometer was found to stand at 100.5° at night and 99° in the morning. From this time it gradually came down until it was 98.5° at night and 98° in the morning, and it has continued thus until the present time. With regard to the other symptoms, the sweating stopped the first night and did not recur. The cough became less and less, and in six weeks ceased entirely.

In two months from the time of her commencing the hypophosphite treatment she wrote to me from the country, stating that she often walked six miles in the day. In addition to the hypophosphites she inhaled twice daily a weak solution of ipecacuanha wine.

(To be continued.)

## THE INFLUENCE OF THE TURKISH BATH ON RESPIRATION.

By JOHN CHARLES BUCKNILL, M.D., F.R.S.

I HAVE recently observed a remarkable change which takes place in the relative activity of the cutaneous and respiratory functions during profuse sweating caused by the Turkish bath, which appears to me to have an important bearing on therapeutics, and which I desire to make known in order that other observers, with better means at their disposal than I possess, may be led to pursue the investigation.

My observations were made only on one subject, a man of fifty-eight years of age, with a weak heart. On four occasions I found his pulse, before entering the bath after exercise, to be 70, and his respiration 18. After remaining five minutes in the bath at 160° F. the pulse was 80, and the

respiration 21; but after remaining twenty minutes in the bath, when profuse perspiration had been induced, the pulse was 100, and the respiration 12, and this rate continued until leaving the bath ten minutes later. After washing and cooling for thirty minutes, the pulse had again sunk to 65, while the respiration had risen to 18. I have asked my friend Dr. Duckworth Williams, of the Sussex County Asylum, to verify these facts, which he has kindly done upon six patients, the details of observations upon whom I append.

Excluding the sixth observation, in which the respiratory movement of the patient became so slight that it could not be counted, and omitting small decimals, it will be seen that in the five remaining cases before the bath the mean of the pulse was 92, and the mean of the respiration 20·6.

During the free perspiration caused by the bath the mean of the pulse rose to 108, while the mean of the respiration fell to 16·4.

After washing and cooling, the pulse fell to a mean of 83, and the respiration rose to a mean of 21.

The small effect upon the bodily temperature of an air-bath of 175° is to be remarked, only raising it, on the average, 1·7°. This is the more curious since animals whose cutaneous function has been stopped by varnishing rapidly lose their heat.

During the free perspiration caused by the bath, the mean of the pulse ratio changed from 20·6 : 92 (say 20 : 90) to 13½ : 90.

After the cooling process the change in the mean of the pulse-respiration ratio was still greater, being 21 : 83.

Is the whole of this change attributable to the well-known vicarious function of the skin to that of the lungs?

Dr. Williams writes me that he "was much struck by the diminution of the respiratory murmur after sweating had set in."

I trust that some one will carry this inquiry further by means of the spirometer.

No. 1.—Admitted with recurrent mania. Is now convalescent, and in good bodily health. Temperature of bath 175°; was in fifteen minutes. Skin acted freely. In the habit of having Turkish baths.—Observations before bath: Pulse 80; temperature 98°; respiration 21, and respiratory murmur loud. When skin was acting freely: Pulse 100; temperature 99·6°; respiration 17; respiratory murmur indistinct. After a wash, cold douche, &c.: Pulse 76; temperature 98·2°; respiration 20; and respiratory murmur again strong.

No. 2.—Admitted with melancholia. Is now convalescent, and in very good bodily health. Temperature of bath 180°; was in twenty minutes. Skin acted very freely.—Observations before bath: Pulse 84; temperature 98·4°; respiration 18; respiratory murmur loud. After skin had acted freely: Pulse 100; respiration 16; respiratory murmur indistinct; temperature 100°.—After a wash, cold douche, &c.: Pulse 80; respiration 20; respiratory murmur loud; temperature 98°.

No. 3.—Admitted with recurrent mania. Has now a lucid interval, and is in robust health. Has regularly had the bath for years. Temperature of bath 175°; was in twenty minutes.—Observations before bath: Pulse 76; temperature 98·7°; respiration 20; very strong respiratory murmur. Observations when skin had acted freely: Pulse 100; respiration 15; respiratory murmur slight; tem-

perature 99·8°. After a wash, cold douche, &c.: Pulse 80; temperature 98·4°; respiration 20; respiratory murmur again strong.

No. 4.—Admitted with strong suicidal impulse and refusal of food. Is now convalescent, and has been treated with the Turkish bath. In good bodily health. Temperature of bath 175°; was in twenty minutes.—Observations before bath: Pulse 120, evidently from nervousness; respiration 20, murmur fairly loud; temperature 98·5°. When skin had acted freely: Pulse 120; temperature 100°; respiration 16, murmur barely perceptible. After a wash, douche, &c.: Pulse 100; temperature 98·7°; respiration 20; murmur still indistinct.

No. 5.—A case of chronic dementia in good bodily health, and has frequently had the bath. Temperature of bath 175°; was in thirty minutes.—Observations before bath: Pulse 100; temperature 98·6°; respiration 24; murmur loud and irregular. When skin had acted freely: Pulse 120; temperature 101°; respiration 18; murmur indistinct. After a wash, douche, &c.: Pulse 80; temperature 97·9°; respiration 24.

No. 6.—A case of dementia in good bodily health. Had not taken a Turkish bath before. Temperature of bath 170°; was in thirty minutes.—Observations before bath: Pulse 80; temperature 98·5°; respiration 16; murmur plainly audible. When perspiration was profuse: Pulse 60, was a little faint; temperature 99·5°; respiration so slight that it could not be counted. After washing, douche, &c.: Pulse 100; temperature 98°; respiration 24.

ON A.

## SIMPLE MODE OF EXTRACTING CALCULI ARRESTED IN THE URETHRA.

By J. C. OGILVIE WILL, M.D.,

Assistant-Surgeon to the Aberdeen Royal Infirmary.

THE extraction of a calculus arrested in the urethra is frequently difficult of execution. The correctness of this proposition will be readily appreciated by anyone who has been called on to perform this operation, and is proved by the number of different instruments suggested for the purpose of attaining the desired end. As the occurrence is sudden, there is, as a rule, no time for a premeditated mode of procedure; and as the symptoms may be, and often are, urgent—as in the case of complete occlusion of the passage and consequent retention of urine, which I have myself met with,—immediate action is necessary. Such cases are met with as frequently (if not more frequently) by the general practitioner as they are by the pure surgeon; and as special surgical assistance is not always at hand, as immediate relief is called for, as the modes hitherto proposed, so far as I know, are possibly ineffective, and require the use of appliances many of them complicated and expensive, and which do not find a place in the armamentaria of those who do not devote special attention to the surgical department of the profession,—I desire to draw attention to a method which can be put in practice by anyone who may be called on to deal with a case of the kind. Moreover, the mode

I propose will succeed, as I have myself found, when others fail. Its simplicity and efficiency will be best shown by a short record of a case in which I employed it.

In June, 1874, S. W.—consulted me on account of the difficulty he experienced in passing water. He had observed that his stream was gradually diminishing in size during some months before, but his particular attention was directed to it on the previous day, on finding that he was unable to pass urine when the desire was strong. After a short time, however, he succeeded in getting partial relief, the water running off in dribbles, and the act was attended by great pain at one part of the penile portion of the urethra, where he felt that there was something blocking up the passage. On external examination a localised hardness was distinctly perceptible a little in front of the triangular ligament, and a hard body could be readily felt behind a hard cartilaginous ring. After attempting the introduction of larger-sized instruments, I succeeded in passing a No. 5 catheter into the bladder. A grating sensation was communicated to the instrument as it passed the obstacle, and the presence of a calculus arrested by a stricture diagnosed. The diagnosis was easy, the removal of the calculus extremely difficult, for no forceps in my possession would pass through so narrow an obstruction, as the common urethral forceps, and the instruments suggested by Leroy d'Etiolles, Reliquet, and Civiale, are not so constructed as to be of use in such a contingency. I was unwilling to cut down on the calculus, as in all probability a fistulous opening would have been left, which could not have been readily healed; and as the patient was in a very weakly state of health, internal urethrotomy would not have been advisable. The idea of snaring the calculus by a loop of wire then occurred to me, and I at once determined to give it a trial. Accordingly I passed a loop of tolerably thick silver wire through the stricture behind the calculus, which, after a little manipulation, it caught, but lost its hold more than once; but at length I had the satisfaction of pulling out a thin plate of calcareous matter, much to the delight of the patient, whose expressions of gratitude were unbounded.

In this case a simple loop of wire succeeded when a complicated apparatus, however useful in ordinary cases of bodies arrested within the urethra, could not be used. Though it may appear rather a difficult matter to encircle a urethral calculus with a loop of wire, it is not so, and if we remember that the urethra is not a tube through which any body can be easily pushed along, but a closed valve or long chink, whose sides lie in close contact, the reason of the simplicity of this manoeuvre will be readily understood. The difficulty is not in the snaring, but in the retaining of the hold, the loop being apt to slip, especially if the foreign body be a very small one. To overcome this difficulty I have had a slender silver cannula constructed, which is to be used with the wire loop. The latter should first be passed well beyond the calculus, and the cannula slipped over the projecting ends of the wire, and its point brought to bear against the stone, by which it will be steadied, then by making slight traction on the free ends of the wire, the loop will be brought against the calculus, which will thus be securely fixed between the wire and the mouth of the

cannula. The ends of the wire may then be twisted round the rings with which the cannula is provided at its proximal extremity, and the apparatus withdrawn. By this mode of procedure, the foreign body being tightly fixed between the loop and the mouth of the tube, it cannot possibly slip out, and its extraction can be accomplished with the greatest ease. Although the cannula I refer to is the most suitable instrument for the purpose, an efficient enough one can be extemporised by cutting a bit out of an old catheter; and in some cases the loop of wire will of itself be all-sufficient, as it was in the case just mentioned, and also in that of a child who had a calculus arrested at the bulb, and where a loop of wire was passed behind it, and slight pressure applied to the perineum to steady it, then by a jerking movement the calculus was brought well within the penile portion of the urethra, and by reapplying the wire and again jerking it was thrown out.

The chief recommendations of the mode I propose are its simplicity and certainty, also its almost universal applicability in cases of arrested urethral calculus, or any similarly shaped body whose extraction is called for. The cannula I possess was constructed for me by Mr. Young, instrument-maker, Edinburgh, and is admirably suited for the purpose.

Aberdeen.

## THE EFFECT OF BRIEF EXERTION ON THE RADIAL TRACING.

By C. HANDFIELD JONES, M.B. Cantab., F.R.S.,

Physician to St. Mary's Hospital.

IN a recent paper in *THE LANCET* I stated that the effect of exercise on the radial tracing was to diminish preexisting signs of arterial tension. I have seen no reason to doubt that this is the rule when the exercise has been of some duration, but I have met with one instance where, after exertion of little more than a minute, the tracing presented a well-marked feature of increased tension which was not apparent just before. The tracings taken under this condition present also a remarkable increase in the primary rise, which contrasts very strongly with the opposite effect of more prolonged and severe exercise. A short account of these may not be without interest.

In Fig. 1, *a* is taken while at rest, *b* after about a minute's brisk movement, the sphygmograph re-

maining *in situ*, and the second tracing being taken directly the exercise ceased. The primary rise in *a* is .2 inch, in *b* it is .55 inch. There is no other important change in the tracing; the tension signs are about equal in both.

In Fig. 2,  $\alpha$ , taken at rest, is perfectly normal;  $\delta$ , taken after brief exertion, shows a well-marked shoulder in the fall to the aortic notch, indicative

of delay of the tidal wave. It much resembles some tracings of aortic regurgitation. The primary rise is .25 inch in  $\alpha$ , .55 inch in  $\delta$ .

In Fig. 3,  $\alpha$ , taken at rest, shows more evidence of undue arterial tension being present than the

corresponding trace in Figs. 1 and 2;  $\delta$ , taken just after a hard run, shows, besides a much more rapid rate, a much lower rise, a sharper top, and a much steeper fall to the basal line, which is reached before the aortic notch occurs. The height of the rise in  $\alpha$  is .3 inch, in  $\delta$  .2 inch. The changes imply lessening of the cardiac force in each beat, and lessening of the arterial tension.

In tracings  $\delta$ , Figs. 1 and 2, the heart is evidently stimulated and excited, and answers without any indication of failure to the stimulus. This is probably always the case for a longer or shorter period, except in cases of great and dangerous asthenia, and the length of time the exercise can be continued before lowering of the primary rise ensues—the spring-pressure being of course unchanged—may be taken as a measure of the soundness and endurance of the heart. Increase of tension, on the other hand, does not seem to be constant. I found indications of it only in one out of four instances. Increased *dilation* of arteries is very likely to result from increased cardiac action, unless the outflow is very free. This, however, is quite another affair.

The sphygmometer, used in the same way to ascertain the effect of brief exertion on the heart's action, gives generally a similar result. In seven out of eight individuals the pressure required to arrest the pulse after such exercise was greater than before. This is the reverse of what was observed when the exercise was severest. (*Vide Proceedings of the Royal Society, 1873.*)

Between the above tracings and those of various sthenic and asthenic morbid states there exists often a considerable resemblance, or almost identity. The greater simplicity of the conditions in exercise—not too prolonged—seems to me to make its study of value in endeavoring to interpret the tracing of disease.

Green-street, W.

## A Mirror

OF

## HOSPITAL PRACTICE, BRITISH AND FOREIGN.

Nulla autem est alia pro certo noscendi via, nisi quamplurimas et morborum et dissectionum historias, tum aliorum, tum proprias collectas habere, et inter se comparare.—MORGAGNI *De Sed. et Caus. Morb.*, lib. iv. Proœmium.

### RADCLIFFE INFIRMARY, OXFORD.

#### TWO CASES OF CEREBRO-SPINAL MENINGITIS OCCURRING IN PREVIOUSLY HEALTHY SUBJECTS; A THIRD CASE, DOUBTFUL.

(Under the care of Drs. GRAY and TUCKWELL.)

THE two militiamen in the following cases had been billeted in the town of Oxford for several weeks before admission, together with other recruits. The premises where the men were lodged were inspected, and no bad drains, impure water, or overcrowding were detected. All the recruits were supplied with the same bread, which fact is against Dr. Richardson's theory that poisoned grain is the cause of the disease. The militia had not been exposed to any unusual fatigue or exposure, and no cases have been known to occur in previous years. The only case of illness in the same house where the first case lodged was a man with pneumonia, who came into the infirmary a day or two later. The pneumonia ran a mild course, with a crisis on the sixth day. There had been no case of illness in the house from which the second case came.

The post-mortem appearances in the two cases were precisely similar in the seat of purulent exudation and in condition of internal organs, except that in the case of W. D.—the base of brain and surface of hemispheres were more thickly coated with exudation, and the effusion into the ventricles was greater than in the case of J. W.—. In the case of the latter the spinal cord was more involved and the kidneys were decidedly diseased. No trace of tubercle or syphilis in any organ, and in both cases it was particularly noticed that the spleen was normal.

CASE 1. (Under the care of Dr. Gray.)—J. W.—, aged nineteen, private in Militia, previously in good health, was taken ill on April 17th with rigor, headache, and high fever. On the 19th April he was admitted, complaining of intense headache. There had been no vomiting previous to his admission. Great photophobia; pupils contracted and equal; slight paralysis of right facial muscles; movements of eyes perfect. Tongue dry and brown; sores about mouth; bowels not opened for five days. Heart and lungs normal, and no eruption. Trace of albumen in water. Patient is restless and does not like to be disturbed; commenced to vomit in the evening, and continued to do so, off and on, through the night. Pulse 116; respiration 24; temperature 104°.

April 20th.—Much drowsiness and stupor; facial paralysis more marked; pupils equal. Is restless and moaning; respiration sighing. Ordered five

grains of calomel, half a drop of croton oil; head shaved, ice applied; mercurial inunction every four hours. Passes urine under him. Morning: Pulse 120, respiration 82, temperature 102° 6'. Evening: Pulse 120; respiration 40; temperature 104°. Powder repeated in evening; bowels unmoved.

21st.—Cannot be roused to consciousness; head retracted; facial paralysis very marked; right conjunctiva insensible to touch; deviation of eyes upwards and to right; frequent clonic convulsion of right arm. By the evening, complete right hemiplegia. Powder of calomel and croton oil were repeated; bowels unmoved. Morning temperature 102°; evening temperature 102° 2'.

22nd.—Two convulsions last night, the first general, the second unilateral (right); head retracted, hurried breathing, profound coma, ending in death about noon. Morning temperature 103° 6'.

CASE 2. (Under the care of Dr. Tuckwell).—W. D.—, aged twenty, militiaman, in previous good health, and of sober, steady character, was seized on April 25th with rigor, headache, and vomiting. He was admitted on April 26th in a state of drowsiness and stupor, unable to stand or sit upright without assistance; very irritable, will not answer questions or protrude tongue, resents any interference, moans, and pulls bedclothes over him. Very restless, lies quiet for a few minutes together, suddenly cries out, and turns about in bed; great photophobia, angle of mouth drawn to left slightly, and there is frequent twitching of left side of face and left limbs. Tache cérébrale not marked, but there is erythematous blush over forehead; hyperæsthesia of surface of body generally. Right arm bent and rigid, thumb bent into palm of hand; distinct loss of power of right hand compared to left. No especial tenderness or tension of cervical muscles. Tongue coated but moist, abdomen hard and retracted, bladder distended. Urine drawn off by catheter, specific gravity 1032, acid, small quantity of albumen. Morning: Temperature 100°; pulse 84; respiration 30. Evening: Temperature 103°; pulse 84; respiration 36. Two grains of calomel every second hour.

27th.—Same restless, drowsy condition; head and neck retracted, more markedly so on supporting patient in bed; less power in right arm; slight double convergent strabismus; twitching of left face and limbs. Three loose stools passed, not unconsciously; urine drawn off, small in quantity, albumen large. Temperature 103°; respiration 32; pulse 88.

28th.—Is more conscious; complains of pain in head and back; knew his father. Less jactitation of left limbs and less general restlessness. Strabismus more marked, especially in left eye; head more retracted, right arm less rigid, hand cold and blue. Eruption of herpes on right cheek and also on body. Urine passed without catheter. One loose stool. Morning: Temperature 101° 6'; pulse 96; respiration 24. Evening: Temperature 103° 5'; pulse 100; respiration 32.

29th.—Has relapsed into unconsciousness; restlessness extreme, retraction of head greater, deglutition difficult, mucous râles on both sides of chest and cough; no dulness on percussion. Morning: Temperature 103° 2'; pulse 120; respiration 30. Evening: Temperature 100° 2'; pulse 116. Passes excreta under him; some urine obtained, albumen

in small quantity; no action of bowels. Calomel discontinued, gums slightly touched.

30th.—Continues in same condition; great oppression of breathing; still restless, but much weaker; tongue dry and brown. Morning: Temperature 100° 6'; respiration 32; pulse 100. Evening: Temperature 102°, respiration 60; pulse 138. No action of bowels; urine albuminous.

May 1st.—Same. Morning: Temperature 102° 6'; respiration 80—90; pulse 160. Evening: Temperature 100° 2'. Urine albuminous; specific gravity 1028.

2nd.—Same. Morning: Temperature 99°; respiration 60; pulse 160. Evening: Temperature 102° 6'. Urine albuminous.

3rd.—Conjunctiva of right eye insensitive; reflex action on touching left; strabismus very marked; pupils widely dilated and fixed; right arm flaccid, and quite paralysed; tracheal and bronchial râles. Morning: Temperature 101° 6'; respiration 60; pulse 160. Evening: Temperature 102° 4'. Two loose involuntary motions; urine, specific gravity 1028, albumen large.

4th.—Died at 3.15 A.M. After death, temperature rose to 105°.

There was no convulsion, tache cérébrale was not marked, and no paralysis of legs till the paralysis became general. Temperature in right axilla was slightly higher than in left during last few days.

*Post-mortem examination, thirty hours after death.*—Rigor mortis well marked. Deep purple staining of all the depending parts of the body.—Brain: Firm adhesions were present, at one part between the dura and pia mater, on the upper surface of each cerebral hemisphere, for a space about as large as a shilling, close to, and on either side of, the longitudinal sinus. Pia mater highly vascular throughout. Patches of a greenish-yellow purulent exudation lay upon the superior frontal convolution of either hemisphere, and on the posterior part of the middle frontal, being especially marked around the veins which converged towards the Sylvian fissure. This exudation, in comparatively smaller quantity, was followed along the Sylvian fissure to the base of the brain, where it became much more abundant. Here a thick green layer, of firm consistence, extended forwards to the optic commissure, backwards to the middle of the pons, and for a short space over the cerebellar hemispheres. Another large patch lay on the under surface of the cerebellum, reaching up to, but not into, the fourth ventricle. The posterior half of the pons, and the medulla on both its surfaces, were very vascular superficially, but quite free from exudation. The white substance of the brain was very vascular. There was no excess of fluid, and no pus in the lateral ventricles. The fornix and septum lucidum were entire.—Spinal cord: On slitting up the sheath posteriorly, a layer of greenish purulent matter was seen extending from the upper cervical region to the cauda equina, varying in thickness in different parts of its course. Thus, in the upper cervical region it was not so thick as to hide the deeply-congested pia mater which peeped through beneath it, while in the upper dorsal region it rapidly increased to one-eighth of an inch in thickness, and in the lower dorsal region to as much as one-sixth of an inch. It lay beneath the visceral arachnoid, between this and the pia mater, and was firm and

concrete in consistence. At that part of the cord where the nerves which form the brachial plexus have their origin, it was noticed that the layer of pus was thicker and more abundant on the right side than on the left. Below this point, the roots of all the spinal nerves were bathed in pus. The anterior surface of the cord presented a very different aspect to the posterior. The pia mater was here highly vascular throughout; in the cervical region it was slightly turbid, more so in the dorsal, while in the lower dorsal and lumbar regions it was coated with a very thin layer of the same purulent matter which was so abundantly present on the posterior surface. The cord itself was not softened in substance.—The lungs were both congested, and very oedematous. The heart was healthy. The liver weighed fifty ounces, and was healthy. The spleen weighed four ounces, and was healthy. The kidneys weighed, right five ounces, left five ounces and a half. In both the capsule was adherent in places, the cortex was thin, and the stellate veins were very marked. In the right kidney were two small cysts. The ileum in its middle third was deeply congested, and contained a small quantity of altered blood, but there was no enlargement of the solitary follicles or of Peyer's patches. The mesenteric glands were not enlarged. No trace of tubercle could be detected in any organ.

CASE 8. (Under the care of Dr. Gray.)—John Q.—, aged twenty, tailor's apprentice, living in Oxford, was admitted Dec. 21st, 1875. After feeling giddy for a few days, but otherwise in his usual good health, he began, on Dec. 18th, to suffer from severe headache, chiefly frontal, which continued up to the time of admission, and prevented him from sleeping. On admission, the tongue was much furred; no action of bowels since headache began; no eruptions; no history of injury to head; no discharge from either ear. Urine normal; chest clear; pulse 60. Evening temperature 102°.

Dec. 23rd (sixth day).—Still intense headache, with foul tongue, in spite of free purging yesterday with calomel and jalap; also to-day he has double vision, much intolerance of light, and well-marked cerebral maculæ. Head shaved; blister to vertex. To have five grains of iodide of potassium with one drachm of the solution of perchloride of mercury three times a day.

25th (eighth day).—The same symptoms, with the addition that he is getting very drowsy, dislikes to be touched or in any way disturbed, lies with his head drawn backwards, and has inward squint of left eye. Urine passed under him once to-day. The dose of iodide of potassium increased to eight grains.

28th (eleventh day).—Since last note frequent complaint of *pain in back of neck and down spine*. Increasing stupor and retraction of head. Sometimes inward squint of left eye, sometimes involuntary rapid twitching of both eyes towards the right. *Arms very tremulous*. Slight salivation.

29th.—Mouth drawn to right side. Tonic, alternating with clonic, *convulsions of arms and legs* throughout the day.

30th (thirteenth day).—Died. Since admission temperature has steadily fallen from 102° to 97°; the pulse has steadily risen from 60 to 110. Liquid nourishment was taken without trouble throughout; and vomiting occurred only once.

*Autopsy twenty-eight hours after death.*—Head: No mischief in any portion of the skull-bones or of the dura mater. On upper surface of brain all the vessels very gorged; convolutions flattened from pressure. Arachnoid smooth and moist, but opaque here and there where it bridged over spaces between convolutions. Under surface showed no sign of disease; no lymph anywhere. A doubtful appearance of scattered, very minute, miliary tubercles (?) in pia mater covering pons and medulla oblongata. (Some pieces of this were afterwards examined under a microscope and showed a very great amount of cell-proliferation in the track of the bloodvessels, the cells here and there aggregated into dense clusters.) The ventricles much distended with clear fluid; septum lucidum softened. The rest of the brain-substance quite healthy. Spinal cord not examined.—Chest: No effusion in pericardium; substance and valves of heart healthy. On pericardial surface of right auricle some 15 or 20 closely clustered, slightly raised spots, like very small flattened specks of white wax; with moderate force they could be scraped clean off. A smaller cluster of the same spots on pericardium just where it is reflected from the ascending aorta. Both lungs quite free from tubercle or other disease; no old scars. All the abdominal organs, including the whole length of the intestines, carefully examined; no trace of tubercle or any other disease.

*Remarks.*—Looking to the very scanty and doubtful evidence of any tubercle in this case, and the extreme rarity of tubercular mischief in brain without coexisting tubercle in some other organ or part of the body, was not this probably a case of idiopathic cerebral (and probably spinal) meningitis? The records of autopsies of this disease quote many cases in which nothing more than great hyperæmia of membranes of brain and cord could be found after symptoms just such as this man had during life.

## ST. THOMAS'S HOSPITAL.

CASE OF ILIO-FEMORAL ANEURISM TREATED SUCCESSFULLY BY LIGATURE (WITH CARBOLISED CATGUT) OF THE EXTERNAL ILIAC ARTERY.

(Under the care of Mr. SYDNEY JONES.)

THE following case, for the notes of which we are indebted to Mr. Potter, presents several features of clinical and pathological interest. Firstly, the situation of the disease, although not rare, is by no means common; aneurism of the femoral artery generally occurring nearer the apex of Scarpa's triangle. Secondly, the mode of the application of the catgut ligature was unusual. The advocates of catgut ligatures particularly insist that, as the material is capable of being absorbed, the ligature should be cut short and left in the wound. In this instance, Mr. Jones purposely allowed the ends of the ligature to hang out of the wound to act as a drainage. It is important to note that the two ends came away separately eight days after the operation. At what point the ends of the catgut were detached could not be determined. Lastly, it is remarkable that, although the aneurism was cured, and everything, as far as the limb



was concerned, progressed satisfactorily, yet there was no return of pulsation in either the posterior or anterior tibial artery.

Henry H—, a robust laborer, aged thirty, married, was admitted into Edward ward on Sept. 29th, 1875, with a pulsating tumour in the right groin. The man had always had good health, and had lately been employed as an omnibus conductor, and, although subject to rheumatic pains in the larger joints, he had never had rheumatic fever. He had drunk freely of beer (six to seven pints a day) and spirits until his present illness. His father died aged fifty from "breaking a blood-vessel"; his mother living and healthy; two sisters and a brother phthisical. No evidence of aneurism nor gout in family.

About a month previous to admission he noticed a pulsating lump in right groin, the size of a walnut, for which he could not assign any cause. He continued his employment till Sept. 27th, when he consulted Mr. Palmer, in Newbury, who advised him to lie up. This he did, and refrained from stimulants, and took but little food. Two days afterwards he was admitted into the hospital.

On admission the following notes were taken: Dark and somewhat sallow complexion, muscular frame, quiet and satisfied temperament. Superficial arteries are neither rigid nor atheromatous to the touch. Heart sounds not attended with murmur. Temperature normal. An ovoid pulsating tumour can be felt and seen to beat towards the inner side of, and in connexion with, the femoral artery, extending beneath Poupart's ligament, and involving the lower part of the external iliac artery. It is twice the size of a walnut, and beats synchronously with the radial pulse, 65 in the minute. No pain on manipulation. The pulsation of the tumour gives a thrilling sensation to the hand. Aneurismal bruit distinctly heard with stethoscope. The subcutaneous tissue appears to be matted with aneurismal walls.

On Sept. 30th flexion of the leg was employed, the whole limb having been bandaged with flannel and cotton-wool, one-third of a grain of hydrochlorate of morphia given subcutaneously every night. Purge and enema given. Meat diet, with half a pint of porter.

As he complained of pain and numbness of the leg and foot, even when the limb was only semi-flexed, and was very restless, Mr. Jones decided upon placing a ligature on the external iliac artery above the aneurism.

Oct. 6th.—An enema having been given beforehand and chloroform administered, an incision five inches long was made parallel to Poupart's ligament, and about an inch above it, commencing one inch internal to anterior superior spine of ilium. The fascia and muscles were divided on a director, and the transversalis fascia exposed; this was then divided. The wound was freed from blood, and pressure was made upon the external iliac artery. This controlled completely pulsation in the aneurism. A carbolised ligature was then placed around the vessel from one and a half to two inches above the aneurismal dilatation, and the ends of the ligature allowed to remain outside the wound to act as a drainage; ligature was followed by entire cessation of pulsation in tumour and femoral artery. Wire sutures used for superficial wound; almond-oil dressing and cotton-wool applied. Leg and thigh enveloped in cotton-wool, and bandaged with flannel in its entire length.

Patient half an hour after operation (2.30 p.m.) had subcutaneous injection of one-third of a grain of morphia, which was repeated at 10 p.m.; limb comfortably warm during evening; no pain in groin or elsewhere.

7th.—Absence of sickness after operation. Patient remains quiet, with thigh slightly flexed and raised. Pulse 69, temperature 100° 9', urine 1027, no albumen. Morphia injection every night.

9th.—No pain at wound. No pulsation to be felt in anterior or posterior tibial arteries. Tongue clean. Takes fluid nourishment well. Sutures removed and wound strapped with soap plaster. Almond oil dressing. Temperature 98° 5', pulse 60. Has to-day a little cough, no expectoration. Appears a little jaded.

10th.—Rheumatic pains in shoulder. Pulse 56, temperature 98° 7'. Wound appears quite healthy, with marginal blush; discharges a healthy pus; no pain. Strapped and dressed with almond oil. Slight tenderness of abdomen; cough increasing.

12th.—Wound continues to look well; the cicatrix is forming towards middle and outer end. Condition of patient good. No evidence of pulsation in posterior tibial artery. Pulse 66, temperature 99°.

14th.—Respiration easy; no abdominal tenderness nor pain. The two ends of the ligature, which had remained at inner end of wound since operation, have to-day come away separately.

15th.—Slept better than usual. Feels comfortable. At 8 a.m. several clots of dark blood were found which had escaped from wound, amounting to two ounces. Patient states that he had felt the blood running away for a period of three hours. A constant watch is kept upon the case to prevent, if possible, further hæmorrhage. Temperature, evening, 98° 9'. The oozing has continued slightly at intervals throughout the day. Lint wrung out in iced water kept in contact with wound. Morphia injection at night as usual.

16th.—Restless night. Temperature 99° 2'; pulse 54. Oozing ceased; a little pain in abdomen; tongue clean. 3 p.m.: Temperature 98°. Discharge just tinged with blood.

17th.—Patient appears none the worse from hæmorrhage. Appetite good. Pulse remains full. No pulsation in sac.

19th.—Ice water discontinued; almond oil reapplied. Now allowed solid food. Complaints of cough during night, and a distressing sensation across chest. Expectoration mucus. Pain at lower part of abdomen relieved by enema.

22nd.—Progressing favorably. Small amount of healthy discharge from wound. Bronchial râles over posterior part of both lungs; cough increased. Discharge still slightly tinged with blood.

25th.—Bronchitis continues; expectoration more free. Poultices applied to chest. No pulsation perceptible in either tibial arteries of right limb. The greater part of wound has healed up; inner end discharges a healthy pus. Temperature 98° 1'; pulse 54. Takes a mixture containing ipecacuanha wine and paregoric.

Nov. 1st.—Allowed to sit up in bed. The discharge, which is small in quantity, is slightly tinged with blood.

6th.—Wound now healed perfectly. Does not have injection at night.

7th.—Bronchitis well; tongue clean and moist.

16th.—Allowed to sit up every day.

Dec. 20th.—Dismissed from hospital, cured.



When patient was discharged there appeared to be no pulsation in either anterior or posterior tibial arteries, in femoral, nor in tumour. He has since resumed his occupation, and suffers no inconvenience.

### HITCHIN INFIRMARY.

TUBERCULOSIS; EFFUSION INTO THIRD AND FOURTH VENTRICLES; CEREBRO-SPINAL MENINGITIS.

(Under the care of Mr. C. J. GRELLET.)

For the following notes we are indebted to Mr. E. A. Praeger.

J. M.—, aged thirteen, admitted March 18th. Her father has tertiary syphilis. Her mother stated that four months ago, while at school, she fell from a form on to her back. She then lost the use of her upper extremities for several weeks, but recovered somewhat, till a fortnight ago she complained of a constant pain in the head and back, in the region of the lower cervical and upper dorsal vertebrae. Constantly vomited her food.

On admission she presented a dark complexion, the skin being copper-colored, dry, and harsh. Voice small and husky, somewhat resembling the voice of chronic laryngitis. Very badly nourished; very wan and weak. Respiration hardly perceptible, the thorax being scarcely elevated when she draws a deep breath. Pectoriloquy all over region of left lung and apex of right lung. Base of right lung dull on percussion, and respiratory murmur somewhat harsh. Slight cough; very little expectoration. Respiration fourteen in the minute. Pulsation between the tendons of the sternocleidomastoid muscles. Heart-sounds feeble; no murmurs. Pulse 48. Appetite bad. No pain over kidneys. Secretion of urine normal. Urine acid, containing albumen to extent of one-sixth, slightly saccharine; sp. gr. 1030. Ordered a diet consisting of beef-tea and milk, as she could not take solids. To take a mixture containing ten drops of dilute phosphoric acid and ten grains of hypophosphite of soda three times a day, and a dessertspoonful of phosphorised cod-liver oil every night. Retained her food.

March 19th.—Slept well. Pulse 48; respiration 14; temperature below normal. Retained her food.

20th.—Vomited all her food yesterday. Pulse 48; respiration 16.

21st.—Vomiting continues after meals. Very drowsy, waking up to vomit, and then relapsing into a semi-comatose state. Face flushed; head cool.—6 P.M.: Has been very restless all the afternoon. Very delirious. Vomiting very troublesome. Given an effervescing aperient draught, which was vomited immediately. Pulse 80; temperature 102.2°; respiration 80. An enema of warm water was administered. About eight o'clock she had some ammonia, brandy, and soda-water, which stopped the vomiting. To have linseed and mustard poultices all round chest and back, as she seems to have difficulty in breathing. Ice-bag to head, which is very heated.

22nd.—Passed a fair night; not quite so drowsy. Cannot take her food. Is very quiet, and does not speak unless spoken to, when she only answers in monosyllables. Pulse 79; temperature 101°.

Another enema administered.—10 P.M.; Pupils dilated evenly; light has no effect on them. Bowels moved after five grains of jalapine. Still very drowsy. Has to be fed with a spoon. Pulse 140; temperature 108°. Urine neutral; albuminous to extent of one-twelfth.

23rd.—Pupils still dilated and insensible to light. On being asked to put out her tongue she evidently understood, but was unable to comply with the request. Can hardly swallow, food remaining in her mouth a long time. Want of co-ordination in muscles of upper extremity. Cannot move her legs, and does not appear to have any sensation in them. No control over sphincters. Appears to have lost all idea of articulation. On percussing in the region of the lower cervical and upper dorsal vertebrae, she appeared to experience great pain, as she cried out. Redness all down the spine. Tissues over bodies of the vertebrae, and over the upper dorsal especially, are very puffy. Respiration feeble; pulse 176; temperature 101°. Urine alkaline, and loaded with phosphates. Blisters to be applied behind each ear and on nape of neck. Mustard-plaster down the whole length of vertebral column. Nutrient enemata. To take five grains of iodide of potassium in camphor-water every four hours.—10 P.M.: Continues in much the same state. Reflex action in both legs. Pulse 174; temperature 101°.

24th.—Passed a fair night. Keeps her forearms flexed and across her chest. On attempting to extend them forcibly, they fly back as if moved by a very strong spring. No control over sphincters. Fed entirely by nutrient enemata, as she has lost the power of deglutition. When spoken to she understands what is said, but has not the least power of reply. Pulse 140; temperature 100.2°. Urine alkaline, loaded with phosphates.—10 P.M.: Pulse 140; temperature 100°.

25th.—Appears more conscious this morning. Still unable to speak. Cannot move her arms. Is totally helpless. Sphincters still relaxed. Electricity was applied over the phrenic nerve, the corpora striata, and cervical vertebrae by means of Stöhrer's continuous-current battery. This roused her slightly. Pulse 120; temperature 99.3°. Urine alkaline, containing phosphates.—10 P.M.: Spoke three words in inquiry for her sister this afternoon. Breathing stertorous; *alae nasi* working. Respiration 25; pulse 140; temperature 102°. Five grains of carbonate of ammonia to be added to each dose of her mixture.

26th.—All the muscles are very rigid this morning. Bladder distended. Catheter passed. Urine acid; slightly opaque after boiling. Motions firm and clay-colored. Electricity applied again, but with less effect than yesterday. Pulse 140; temperature 100°.—10 P.M.: After application of electricity this afternoon, she revived a little for about an hour, but has again relapsed into the drowsy condition. Respiration 46; pulse 180; temperature 102°.

27th.—Has been gradually sinking all night. Ptosis of left eyelid. Injections have been continued at frequent intervals since the 23rd. Died at 10.30 A.M.

*Autopsy, five hours after death.*—No rigor mortis.—Lungs: Both lungs had a gritty feel, and contained tubercular deposits. Base of right lung had numerous adhesions, some being so strong as not to be broken down by the finger. Left lung collapsed, amounting almost to pneumothorax.—

Heart very much congested. Spleen and kidneys healthy. Intestines very anæmic.—Spinal cord: Dura mater very much inflamed; vessels very much congested. On making a section in the region of the lower cervical and upper dorsal vertebrae the medulla spinalis was found to be considerably softened, being about the consistence of cream.—Brain: The longitudinal sinus was full of coagulated blood. The middle meningeal arteries on either side were of greater calibre than usual. On palpation the whole of the encephalon fluctuated like a huge abscess. On slitting the tentorium cerebelli an ounce and a half of serous fluid escaped. On removing the brain the two hemispheres fell apart, exposing the lateral ventricles. The third and fourth ventricles filled with about an ounce of serous fluid. The iter a tertio ad quartum ventriculum was widely dilated, so that it would admit an ordinary pencil. The white matter was very much softened, being of the consistence of cream.

This case was admitted as a case of tuberculosis, and accordingly treated with hypophosphite of soda until the drowsiness was noticed. The effusion into the ventricles was then diagnosed, the redness and tenderness over the spine leading to the diagnosis of cerebro-spinal meningitis of the tubercular form, it being distinguished from the traumatic variety chiefly by the variations in pulse and respiration. Treatment by iodide of potassium was adopted as the only method offering a chance to the patient. The good effects of the constant current in rousing her were most marked.

## ST. MARY'S HOSPITAL.

### RHEUMATIC FEVER TREATED BY SALICYLIC ACID.

(Under the care of Dr. SIEVEKING.)

For the following notes we are indebted to Messrs. J. Jackson Gawith and H. Sworder, house-surgeons.

CASE 1.—Julia L., aged forty-five, was admitted into hospital on March 27th, suffering from acute rheumatism. About a week before admission she was taken ill with severe pains in the hips and legs, loss of appetite, scanty and high-colored urine, and general feverishness. When admitted she had well-marked symptoms of rheumatic fever; temperature 103.2°; pulse 108; tongue thickly coated with fur; pain and swelling in both knees, more especially in the right, also some tenderness in the right ankle.

Salicylic acid was ordered in twenty-grain doses every hour for six hours, together with milk, beef-tea, and imperial drink as diet. The first powder was given at 4 P.M., the temperature being 103.2°. After the second powder she expressed herself as feeling much relieved, but complained of some slight noises in her ears and feeling rather silly. It was certainly difficult to make her answer questions properly. Heart-sounds quite normal. Temperature after the fourth powder 101°; temperature after the sixth powder 99.2°.

March 28th.—Had a fairly good night; perspired very freely; tongue still furred; knee-joint still a little swollen, but feels about normal in temperature. Temperature 99.2°; pulse 100; urine cloudy, sp. gr. 1010, acid, a very little albumen.

29th.—Slept well; tongue cleaner; bowels confined; no pain anywhere; feels quite well, but weak. Temperature 10 P.M. last evening 99°; temperature at 9 A.M. this morning 98.4°; pulse 88; heart sounds quite normal; perspired a little during the night; temperature this evening 98.2°; pulse 88.

30th.—Had a very good night; appetite improving; bowels open; in no pain; no heat or swelling of knees; no albumen in urine. The following mixture ordered:—Six grains of citrate of quinine in infusion of quassia three times a day.

April 2nd.—Still going on favorably; is in no pain. Can stand, but is too weak to walk.

5th.—Convalescence continues. Patient can walk about the ward well, and appears quite strong again. No morbus cordis.

7th.—Was discharged to-day, perfectly well.

CASE 2.—Emma H., aged twenty-seven, unmarried, a servant, admitted March 25th. She had severe pain in the left knee, which was swollen and red, and about an inch and a half larger than the other, with some effusion into the joint. There was also some pain and tenderness in the right ankle, and on the inner side of the same there was an erythematous blush, which gave rise to a suspicion of the formation of an abscess. She had not been well for a fortnight, but was only forced to remain in bed three days before admission. Tongue thickly coated; bowels constipated; temperature 101.4°; pulse 110. Salicylic acid, in twenty-grain doses, ordered every hour for six hours. After the fourth powder the temperature was 101.8°, but the pain in the knees was very much less. After the sixth powder the temperature was 100° and the pulse 108; skin very moist, and in a free perspiration.

March 26th.—Had a good night. Tongue furred; rather dry in middle. No pain, except a little in right knee. Left knee still one inch larger than right.—10 A.M.: Temperature 98.8°; pulse 104.—12 P.M.: Temperature 100.4°; pulse 110. At 3 P.M., the temperature being 101.4°, salicylic acid was ordered, in twenty-grain doses, every hour for four hours.—Temperature, 4 P.M., 101.2°; 5 P.M., 101.2°; 6 P.M., 101°; 8 P.M., 100.2°; 10 P.M., 99°; 12 P.M., 99°. She vomited up two of the powders, so they were repeated.

27th.—Slept well. Tongue furred. No pain in joints when movement is made, but the swelling over the ankle is still hot, red, and painful. No heart-sounds to note. Temperature 99.8°; pulse 104.

28th.—Had rather a restless night, but in no pain this morning. Temperature 99°; pulse 100.

29th.—Seems quite free from rheumatic pain, but complains of great pain in swelling at right ankle. Poultice ordered to be applied. Tongue cleaning. Left knee is much smaller than yesterday. Temperature 100.4°. Ordered ten grains of salicylic acid three times a day.

30th.—Had a very bad night. Could not sleep on account of pain and discomfort in the right ankle. No signs of any return of rheumatism. The abscess was opened, and patient put under surgical treatment, and is now convalescing rapidly.

## WEST LONDON HOSPITAL.

## CASE OF HEMATOMA\* OF THE DURA MATER.

(Under the care of Dr. THOROWGOOD.)

THE following details are from notes by Mr. Angove, house-physician.

Robert M—, aged fifty-seven, cabman, admitted April 17th. A spare, dark man; has been subject to a great deal of exposure for some years, and, though a hard spirit-drinker, has had good health up to a month ago, when he had a fall. For a fortnight after it he complained of pain in his head and a general feeling of malaise, in consequence of which he laid up. A fortnight before admission the pain increased, with occasional shiverings, and for the last few days he had been slightly delirious. His bowels had not been open for four days.

When admitted he was in a semi-unconscious condition and speechless. When told to show his tongue, he partially did so after a slight delay. His pupils were contracted and very sluggish; his muscles were in a state of extreme rigidity, the flexor muscles of his arms being particularly so. There was no paralysis; tongue brown. Ordered five grains of iodide of potassium in peppermint water three times a day, and a pill containing three grains of calomel and one drop of croton oil at once.

April 18th.—In much the same condition. Had slept most of the night, waking up at frequent intervals for a short time. Takes what liquid nourishment is offered him; bowels not open; passes his urine involuntarily, some of that collected being sp. gr. 1025, high-colored, and containing a trace of sugar, but no albumen, acid reaction. Respiration 14, regular, not forced; face dusky; tongue brownish. Chest-resonance normal; heart-sounds natural, though rather weak. Ordered ten grains of calomel and colocynth pill and a simple enema.

19th.—In just the same condition; the enema returned at once, owing to some obstruction in the rectum. On an examination it was found filled with hard scybalous masses of feces, which were cleared out by the hand, and a large quantity of warm water injected high up. A short time afterwards a considerable quantity of partially liquid feces was ejected. In the evening he seemed better, and, when asked what he felt, complained of pain in the left side of his neck, but not of his head.

20th.—Less conscious than he was yesterday evening. Still takes what liquid nourishment is offered him. Bowels not open. Tongue dry, brown, and cracked.

21st.—In just the same condition. Bowels not open. Ordered five grains of calomel.

22nd.—Much more unconscious. Died suddenly in the afternoon.

The examination of the body was made twenty-four hours after death. On removal of the calvaria, to which the dura mater adhered very closely on the left side of the parietal convolution, this membrane was of a green color, and when cut into a small quantity of partially disintegrated blood escaped from between it and the pia mater. These two membranes were considerably thickened and stained of a brownish color. On the right side, towards the temporal fossa, was what at first seemed a tumour growing from the inner surface

of the dura mater, but which, when carefully examined, was found to be a sac about four inches long, two inches deep, and one inch thick. Its outer wall seemed to be composed of dura mater, and the inner wall of pia mater; it was full of blood-clot undergoing the process of disintegration. The walls of the sac and the membranes around for a little distance were considerably thickened, and stained brown. The brain was perhaps a trifle congested; it was much compressed, in fact there was a considerable hollow in the right side to make room for the cyst. There was no excess of fluid in the ventricles. The other organs were healthy, with the exception of the left lung, at the base of which there were three or four rather large infarctions of blood.

*Remarks.*—The day after this man's admission to the hospital, at the visit, Dr. Thorowgood and Mr. Angove carefully examined his head for any point of external soreness. Beyond some slight tenderness at the back of the neck there was nothing to point to anything external. The man, though unable to answer questions, was conscious of pain, as was seen when a catheter was introduced.

The general muscular rigidity pointed to some irritative lesion of the encephalon, and note was taken of the constantly contracted state of the pupils, a symptom on which Griesinger lays stress as indicative of irritation of the cerebral surface.

Attention may be drawn to the collection of disintegrating clot on the left side of the brain as well as on the right, as illustrating the correctness of the opinion that the hematoma not uncommonly affects both sides of the brain.

## EDINBURGH ROYAL INFIRMARY.

## CASE OF EXCISION OF TONGUE FOR CANCER; CURED.

(Under the care of Professor SPENCE.)

FOR the following notes we are indebted to Mr. Thomas Spence, M.B., C.M., house-surgeon.

W. W—, aged fifty-four, a light porter, was admitted to Ward 18 (surgical), on January 18th, 1870, suffering from epithelioma of the tongue. The patient was a thin, spare man, of sallow complexion. On the dorsum of the anterior part of the tongue a cancerous ulcer of about the size and shape of a halfpenny piece was found. No glands were affected. The family history was unimportant. The patient confessed to having been a confirmed smoker and drinker, and stated that three years ago he noticed a small pimple on the tongue. This gradually increased, but it was only two months before admission that he applied for medical advice at the Cowgate Dispensary, where he was seen by Dr. Hendry, who sent him to the infirmary.

On Jan. 25th, after the patient had been kept under observation for a week, he was put under chloroform, and Prof. Spence, assisted by Dr. Duncan, proceeded to remove the tongue. An incision having been made in the middle line of the chin, the symphysis menti was sawn through, and the incision prolonged down to the os hyoideum. The two sides of the lower jaw were then held apart, and the tongue being drawn forwards by a vulsellum, a needle armed with strong twine was passed through its tip. By these means the tongue

was drawn forward and then amputated, except about half an inch. The lingual arteries, together with several minor bleeding points, were tied, and the stump was washed with a solution of chloride of zinc, and a piece of twine passed through it to prevent its retraction. The symphysis was then united in two places by thick silver wire, the superficial incision being closed by several silver sutures, and a large drainage tube passed through the back part of the incision. A small œsophagus tube was then passed, by way of the right nostril, through the pharynx into the œsophagus. The patient having been put to bed, twenty-five grains of bromide of potassium and a little brandy were administered.

Jan. 26th.—Temperature 99° 7'; pulse 104. Patient slept badly. He is fed at short intervals with small quantities of milk, white-of-egg, and brandy; and the mouth frequently washed with a solution of chlorate of potash, ten grains to the ounce.

27th.—Temperature 100° 4'; pulse 120. Still sleeps badly. He is now getting beef-tea in addition to the milk, eggs, and brandy.

28th.—Temperature 99° 8'; pulse 96. The cut surface looks pretty clean.

29th.—Temperature 99° 4'; pulse 96. Has slept better. The œsophagus-tube was removed, and the patient fed by a catheter passed into the œsophagus.

30th.—Temperature 99° 2'; pulse 102. Can swallow without the catheter.

31st.—Temperature 99° 8'; pulse 98. The cord left in the root of the tongue was removed. Urine acid, loaded with urates.

Feb. 1st.—Temperature 99° 2'; pulse 94. Sutures in front of chin removed.

2nd.—Temperature 98° 6'; pulse 88. Root of tongue touched with chloride-of-zinc lotion.

4th.—Temperature 98° 4'; pulse 84.

9th.—Temperature 98° 9'; pulse 84. A smaller drainage-tube put in. Discharge slight.

From this date till March 10th the temperature and pulse continued normal. On that day he was allowed minced collops instead of the liquid nourishment he had formerly received, the tongue seeming quite well; and on March 14th a tooth which had prevented the jaw from uniting more closely was removed.

The patient can now speak quite distinctly, and in doing so seems to tilt upwards and forwards both os hyoides and larynx.

The patient left, cured, on April 6th, at which date deglutition and speech were quite easily performed.

Microscopic examination showed the characteristic appearances of epithelioma in a most marked degree.

alive and well, she herself being the mother of two children, both of whom are in perfect health. She declared that she had never before been seriously affected in her life. There was no trace of syphilis. About a year ago the patient noticed that she had a small indurated mass in her right breast, which rolled under her fingers; but as this did not cause her any pain she did not feel at all anxious concerning it. Six months later the tumour had acquired the size of the fist approximately, and had grown considerably harder in substance. Since that time it had made incessant and rapid progress in size.

On admission, she appeared fairly nourished. She stated, however, that she had grown considerably thinner within the last six months. Her appetite had diminished greatly of late, and the digestive organs appeared to be very slow in their functions. The heart-sounds were normal. There was nothing wrong with the lungs. She was considerably inconvenienced by the presence of her tumour, owing to its enormous size, which equalled that of an average adult's head. She experienced great pain, especially at night, in the right mammary region, and along the corresponding arm as far as the elbow. The skin over the tumour was tensely drawn and shiny, and was adherent to its anterior surface. In places the skin presented a bluish tinge, owing to the great vascularity beneath; the rest was colorless. On touching the surface of the tumour, the hand perceived a sensation of fluctuation in three points, which denoted the presence of a certain number of cysts. The whole mass was slightly movable, and its surface was nodulated.

April 2nd.—Operation was performed by M. Péan, who made two curved incisions, having a horizontal direction, and whose extremities were made to meet and to circumscribe the basis of the tumour. The enucleation was then effected with great ease, and a portion of the pectoralis major muscle was cut away with it, as it was found to be lifted up by the tumour. The thorax upon the place where the tumour had been situated was indented instead of being rounded as it is in its normal condition, and the muscles were found to be slightly atrophied. The wound bled considerably, but the hæmorrhage was easily arrested by the application of the hæmostatic pincers of M. Péan, with which he always seizes the bleeding vessels, and which he leaves in the wound under the dressing for a time varying with the size of the vessel, never making use of the ligature, even in amputations or other operations, where large vessels are intercepted. The wound was then brought together with a metallic suture, and the patient was removed into the ward. Evening temperature 39° C.

The tumour, which weighed nearly seven pounds and a half, was found upon examination under the microscope to be of a sarcomatous nature, and contained three cysts, which were filled with semi-transparent fluid.

3rd.—The patient has passed a very fair night, having slept four hours. She took a little soup this morning with pleasure. Pulse 108; temperature, morning, 38° C.; evening, 38° 2'.

4th.—Wound looking healthy. Sleeps well, and says she feels very well, and inclined to eat. Pulse 100; temperature, morning, 39°; evening, 39° 6'. To-day all the hæmostatic pincers were taken off.

## HOPITAL ST. LOUIS, PARIS.

CISTIC SARCOMA OF THE BREAST; OPERATION;  
RECOVERY.

(Under the care of M. FRAN.)

V. F—, aged sixty-seven, washerwoman, married, was admitted into the hospital on March 24th with an enormous tumour of the right breast. The family history was extremely satisfactory, the patient being one of six children, all of whom are

5th.—Continues to go on very well. Has hardly any fever; tongue clean. Pulse 100; temperature, morning, 37.5°; evening 38°.

7th.—Pulse 100; temperature, morning, 37°; evening, 37.6°. Two of the sutures came away to-day. The wound has begun to heal in a small portion, and the remainder is going on satisfactorily. Suppuration is very moderate. Appetite good.

12th.—The patient is doing very well indeed. The wound is progressing favorably. She sleeps and eats well; motions regular. Pulse and temperature normal.

20th.—The patient leaves the hospital to-day, completely convalescent, and is ordered to the country for a fortnight.

### LIVERPOOL ROYAL INFIRMARY.

DISLOCATION OF THE FOOT BACKWARDS, WITH FRACTURE OF THE FIBULA; DIVISION OF THE TENDO ACHILLIS; RECOVERY.

(Under the care of Mr. REGINALD HARRISON.)

A PATIENT suffering from this somewhat unusual form of injury has recently been under treatment in Mr. Harrison's ward. M. T—, aged twenty-eight, was admitted into the infirmary on Dec. 26th, 1875, in consequence of an injury to the foot caused by a slip from the curb-stone. On examination the nature of the injury was readily determined. There was shortening of the anterior surface of the foot and elongation of the heel. The toes were pointed downwards. The fibula was fractured obliquely two inches above the malleolus. The tendo Achillis was extremely tense.

Reduction was readily effected by flexing the leg and applying extension to the foot, but by no apparatus or position could the foot be kept in position. Mr. Harrison had the patient placed under ether, and divided the tendo achillis subcutaneously. The leg was then placed on an iron back splint, with the foot at right angles. By these means the normal position of the parts was maintained, the patient making a good recovery. In six weeks the limb was placed in a plaster-of-Paris bandage, and the patient left the infirmary. He has since been seen, the report being in every respect favorable.

In speaking of this case, Mr. Harrison said that he had only met with two other instances where the injury was precisely similar. In both of these it was found necessary to divide the tendo Achillis. He looked upon this injury as one where the division of the tendon was an essential part of the treatment; in the instances alluded to its adoption had simplified the management of the injury and had in no way interfered with the future usefulness of the limb.

Mr. Cock and Mr. Bryant have both recorded instances of dislocation of the foot backwards, where a similar proceeding was found necessary, from the difficulty experienced in retaining the foot in its position after reduction had been effected.

## Editorial.

### DR. BROWN-SÉQUARD ON THE PHYSIOLOGICAL PATHOLOGY OF THE BRAIN.

THE subject of Localisation of Function and Disease in the Brain has attracted considerable attention since the discovery of Fritsch and Hitzig. The admirable lectures of Professor Charcot at the School of Medicine of Paris, and the researches of Dr. Brown-Séquard, the results of which have been communicated by him to several medical audiences in Boston and in Paris, have clearly shown the practical aspect of the study. Knowing that Dr. Brown-Séquard intends to deliver lectures in several parts of England this summer on the subject, it may be well to give a summary of the new views of that physiologist.

According to the beliefs universally entertained, the left side of the brain is the centre for volition and movements of the right side of the body, and *vice versa*, the right side of the brain for the left side of the body. It is also admitted that one side of the brain contains the centres for the organs of sense of the other side, with the exception that (according to Wollaston's views) the centre for the outer half of the right retina, and that for the inner half of the left retina, are on the right side, and *vice versa* for the other halves of the retina. Dr. Brown-Séquard believes that all these fundamental views are absolutely wrong. He has collected a large number of facts which prove, according to him, that each half of the brain has two sets of conductors, one going to the right half of the body and the other to the left half. He believes that it is so, not only as regards voluntary impulses and common sensations, but also for the various senses. In other words, he contends that each half of the brain is perfectly sufficient for all the actions of muscles, of sensitive nerves, and of the organs of sense, on the two sides of the body. Of course, he is fully aware that every day physicians have under their eyes facts which seem to contradict this view. It is a matter of most frequent observation in the practice of a physician to see a patient who has lost the power of motion and sensibility in one half of the body from disease in the opposite half of the brain. He argues that the question is not whether such a fact contradicts or not his view, but whether that fact is or is not to be explained by admitting that the paralysis and anæsthesia are dependent upon the destruction of a centre or of the conductors for voluntary movement and sensation. There lies the vital point in the new views of Dr. Brown-Séquard. He has accumulated facts which he believes negative the theory that paralysis, anæsthesia, amnesia,

aphasia, and other effects of brain disease depend on a loss of function of either the centres or conductors specially employed in voluntary movements, perception of sensations, power of expressing ideas, by speech, &c. Dr. Brown-Séquard endeavored to prove, for the first time, in his Gulstonian Lectures delivered at the College of Physicians in 1861, that a lesion of one limited part of the brain may produce any symptom; and that, on the other hand, the same symptom may appear, no matter where the seat of the lesion may be. Facts of these two kinds are alone sufficient to show that we are not to look upon symptoms as manifestations of the putting in play of a property, or as direct results of the loss of function of the part diseased. But there are many other arguments brought forward by Dr. Brown-Séquard to establish his proposition that the origin of brain symptoms is not what it is believed to be.

If we take, for instance, the history of paralysis, we find—1. That a lesion in any part of the brain can produce paralysis either on the same side or on the opposite side of the body.\* 2. That paralysis can often appear and disappear although the lesion causing it is a permanent one. 3. That there is no relation whatever in many cases between the extent of a lesion and the degree and extent of a paralysis. 4. That a paralysis may be brought on suddenly, whereas the lesion causing it has existed for some time already, or appear gradually and slowly, although the lesion is a sudden one. 5. That a paralysis can appear on one side, then on the other side, although the lesion remains in one half of the brain. 6. That a paralysis can appear in the arm on one side, and in the leg on the other side, from a lesion in one side of the brain. 7. That paralysis can strike three limbs from a lesion in one side of the brain. 8. That paralysis can strike the two lower limbs or the two upper limbs alone from a lesion in one half of the brain. 9. That paralysis can appear in one half of the body from a lesion involving equally the two sides of the brain along the middle line. 10. That paralysis may appear in a few muscles only, either in the face, or the trunk, or the limbs, from a disease above the pons Varolii. 11. That a paralysis of the sphincters of the bladder, or of the anus, may result from disease in any part of the brain. 12. That the so-called altern paralysis may appear from a disease above the pons Varolii. 13. That hemiplegia when complete is almost always accompanied by some paralysis on the other side, although the producing disease exists only in one half of the brain.

If we examine what relates to convulsions, we find, according to Dr. Brown-Séquard, that what is seen for paralysis is seen also for spasmodic movements. We will point out here this interest-

ing fact, that a lesion in the right side of the brain can produce convulsions indifferently on the right or the left side of the body, while a lesion in the left side of the brain, if it does produce unilateral convulsions, will cause them to appear almost always on the right side.

As regards vision, facts show that a disease in one half of the brain can produce hemiopia either in both eyes or one, and in the corresponding or the opposite halves of the retinae, or a complete amaurosis of either of the two eyes, or of both together.

As regards other symptoms, such as anæsthesia, aphasia, loss of consciousness, &c., Dr. Brown-Séquard endeavors to show that they also may arise from lesions in almost any part of the brain.

Considering the immense variety of phenomena originating from a lesion in one and the same part of the brain, and in presence of facts showing that any limited part of the brain can be destroyed without loss of function, Dr. Brown-Séquard has come to the conclusion that symptoms take rise, not from the loss of action of the diseased part, but from an influence exerted on distant parts of the nervous system by a lesion limited to a part of the brain. He considers the appearance of symptoms as depending on essentially variable conditions of excitability of the nervous tissue round diseased parts. He is convinced that it is impossible to sustain the old theory called the clavier theory, and that we must, on the contrary, admit that a few fibres alone are sufficient to establish full communication between the cells of the spinal cord and the cells of the brain. He holds that there are two sets of conductors, one decussating and the other direct, between each half of the brain and the spinal cord. He maintains that the seat of each special function of the brain, instead of being, as admitted, a cluster of cells localised in a small part of the brain, is disseminated, so that the cells belonging to each are spread over a considerable extent, if not the whole extent, of the brain. He states that there is no more difficulty in admitting that cells that are at a distance of many centimetres one from the other can communicate or act together, than to admit that they can have intercourse when they are at a distance of half a millimetre or less from each other. He believes that symptoms of loss of power, such as paralysis, anæsthesia, amaurosis, aphasia, &c., are due altogether to an inhibitory influence exerted on cells, some near, others far or very far from the place of the lesion. For him, whether amaurosis affects both eyes from a lesion of the spinal cord, or of a sensitive nerve, or of the brain, it is owing in all these cases to an inhibitory action on visual cells, either in the two sides of the brain, or in the retina, or in both parts. Again, if aphasia appears when there is a disease in any part of the left side of the brain, either the third

\* See Dr. Brown-Séquard's Lecture in THE LANCET, April No., 1876.

frontal convolution, or the insula, or any other, it is owing to an inhibitory influence exerted on cells serving to the expression of ideas by speech, wherever these cells are located. We repeat that paralysis and anaesthesia also appear, by a similar mechanism of inhibition, wherever the disease producing these symptoms may exist.

In respect to the group of symptoms consisting in a morbid activity in cells of the brain, what takes place on the occurrence of those symptoms is a setting in action of normal properties by an exciting cause. So that either here, or as regards the phenomena of cessation of an activity, the same cause primarily exists—an irritation.

Dr. Brown-Séquard has no doubt that the old theories must be given up. He is sanguine as regards his power of demonstrating that a great part of his new views is already established by facts, but he acknowledges that some portion requires additional corroboration. He hopes that others will help him in the demonstration of the correctness of his views, or show him in what he is mistaken, and his object in delivering his lectures in England is precisely to have that help or that criticism.

### THE PHYSIOLOGICAL TREATMENT OF INSANITY.

THERE is a widespread wish, and a well-intentioned though perhaps not wholly practical effort in progress, to establish sound working relations between psychology and physiology. It is manifest that such a correlation must form the basis of any rational system of mental medicine. Patients suffering from mind and brain disease may recover, but they cannot be scientifically "cured," scarcely can it be said that they are intelligently treated, unless the interconnexions of mind and the physical organism are understood, at least so far as to elucidate the causation of physico-mental phenomena and make plain the simpler processes by which the organs of thought and force mutually react upon and influence each other. It may be objected that the interdependences of mind and body are so subtle as to elude the researches of the most diligent inquirer; that, in fact, such knowledge is too vast for the present grasp of science, and its pursuit so speculative, if not visionary, as to place it beyond the province of practical physic. We venture to think this not unnatural but erroneous impression is one of the most formidable obstacles which blocks the path of progress. The labors of zealous observers have been rewarded by the discovery that almost every form of mania may be directly symptomatic of organic disease, the collateral consequence of functional disturbance, or the reflex formulation of a perverted sensibility. Even delusions are in most cases distinctly trace-

ble to physical causes under one of the methods of causation just indicated. The facts collected, and in a loose fashion collated, in connexion with mental disease, are eminently suggestive. They clearly point to a system of pathology in no sense different, or, even in thought, separable, from that which the labors of anatomists, physiological chemists, and physical explorers generally, have constructed. There is no boundary line between disease of the body and derangement of the mind. The one shades off into the other, and both are, more or less obviously, interdependent. It is a simple corollary of this fact that the laws of health and normal activity in body and mind—the subjects of psychology and physiology—must stand in such close relation that to study them apart is to do violence to the harmony of nature; while to ignore the claims, the influences, and the necessities of either while attempting to prosecute an independent investigation of its counterpart must not only be to risk disappointment, but to dare the peril of being seriously and even disastrously misled. Strangely, many able students and practitioners of medicine do not perceive the natural and indissoluble bond which holds these two departments together; and hence the attempt to maintain a specialty which can have no independent existence, on the one hand, and an almost total neglect of the rich and singularly productive province of mental symptomatology on the other. Bodily disease, organic as well as functional, may express itself in the mind. Mental disease may, and not unfrequently does, produce its recognizable effects in the body. In the endeavor to separate these two departments of fact and inference the integrity of each is impaired. It would be needless to urge these truisms if it were not apparent that they are too commonly forgotten or overlooked. An attempt to treat bodily disease by exclusively physical remedies, or, more precisely, by drugs and appliances whose action is exclusively physical, would be not less unreasonable than the endeavor to cure or relieve morbid states of the mind by methods wholly mental. The two classes of remedies mingle and blend with each other, like the diseases they are designed to combat and remove. It is difficult to affirm of any method or expedient by which a morbid condition can be removed or mitigated that its operations are either wholly physical or purely psychical. Mental impressions produce physical effects. Modifications in the force and frequency of the heart's action, alterations of blood-pressure and tension of the arteries and arterioles, are coarse results, which may be produced almost indifferently by influences acting through the mind or directly on the organic nervous system. In the light of these considerations, it is clearly of importance to define what precisely is meant by "the physiological treatment of insanity."



The belief that abnormal states of mind frequently, if not always, stand in close relation to morbid conditions of body, is daily gaining strength. The professors of "mental medicine" are, in fact, retiring from the untenable position in which they once sought to place their specialty, and tacitly conceding the argument that it is no separate or separable department, but a simple extension of the province of pathology, the full fruit of which can be gathered only by those who recognise its true character as an integral portion of general medicine, in which the properties and functions of body and mind must be studied in their most intimate relationship. "Physiological treatment of insanity," properly interpreted, means something more than the physiological treatment of bodies that happen to be associated with unsound minds: it is the treatment of insanity as a product and symptom of physical disease. This is the sense in which the phrase is daily gaining wider acceptance as the embodiment of a definite practical thought. It is by the restoration of psychological medicine to its proper place in the great arch science of physiological physic that we hope to see its relations with physiology established on a clear basis. We hail the movement, of which this familiar but hitherto not very intelligible expression is the watchword, as a most healthy reaction. It is one in which the whole profession has a vital interest, and from which it may expect the best practical results. It may be helped forward by a resolute endeavor to work out the relations of cause and effect in every case of abnormal mental phenomena. We hold the connexion which Dr. Maudsley has done so much to establish between kleptomania and general paralysis to be an important step in the right direction. The recent development of opinion on the subject of aphasia marks another point gained. If those who seek the reunion of psychology and physiology would work on the same lines, they might advance the movement, and attain with greater celerity sound practical results.

## Medical Annotations.

"Ne quid nimis."

### TELEGRAPH-WIRE FOR SPLINTS.

SURGEON-MAJOR PORTER, Assistant Professor of Military Surgery, Netley, has forwarded us one of his splints extemporised from telegraph-wire. That this material may be usefully adapted to such a purpose, and that it would serve very well as a temporary measure, we have no doubt. The specimen forwarded us is for the upper arm, and it is accompanied by a pad from a piece of

soldier's serge tunic. It is not difficult to divide telegraph-wire of galvanised iron, and on the suggestion of Dr. Porter, Messrs. Weiss and Son have turned the outer edge of a pair of ordinary straight scissors into a file for the purpose of notching the wire, so that it may be broken at the required point. Altogether, Dr. Porter's invention appears to be an ingenious and useful one; and it occurs to us that it would not be impossible to devise some method or other by which one could make almost any form and size of splint for field surgery purposes out of tubular galvanised iron of sufficient thickness and strength to answer all practical purposes. The plan would be to devise patterns for the upper and lower extremities, accompanied by such directions that a surgeon could either make splints himself or instruct any armorer-sergeant or farrier-sergeant in doing so, out of tubular galvanised iron supplied for the purpose.

### THE COEXISTENCE OF TÆNIA AND CYSTICERCI.

A CASE in which tænia solium and cysticerci coexisted in the same subject was shown lately by M. Broca. The patient had passed numerous segments of the worm, and many tumours existed in the subcutaneous cellular tissue and in the muscles, which were proved by puncture to be cysticercal. Severe cerebral symptoms pointed to the probable existence of a cysticercus in the brain. The tumours appeared very soon after the patient first observed segments of tapeworm in his stools. There was nothing of etiological significance in his circumstances or occupation. M. Broca believes the case to be the first in which the tænia and its cysticercus have coexisted in the same subject. In this he is certainly in error. The association, though rare, has been before noticed, and is probably due to dirty habits, the patient's fingers having been soiled with fæces containing ova, and not washed before a meal; or else to some of the ova having passed directly into the stomach, in consequence of violent vomiting, the tænia being situated high up in the small intestine.

### REMOVAL OF A BUTTON FROM THE BRONCHUS.

AN eminently successful and novel method was resorted to on great emergency for the removal of a button from the left bronchus of a lad, at the London Hospital, on the 12th May. The patient, aged thirteen, had accidentally slipped the button into his trachea on April 23rd, where it had remained without producing very serious symptoms until May 11th, when it fell into the left bronchus, producing symptoms of collapse of the lower lobe of the lung. Mr. Maunder, having performed tracheotomy, first inverted and shook the patient, but with no success; he then placed the patient on his back and pressed through the wound into the left bronchus about seven inches of looped silver wire, and was successful in withdrawing the button, together with a quantity of muco-purulent matter. The patient's urgent symptoms rapidly disappeared, and he is at present doing well.

## A NEW METHOD OF DETERMINING THE AMOUNT OF FREE OXYGEN IN THE URINE.

DR. FREISE (*Comptes Rend.*, 81, p. 229), suggests a new method of ascertaining the amount of oxygen in the urine, which rests on the absorption of this gas by pyrogallic acid in an ammoniacal solution. A solution of this acid is added to the urine to be tested, and the mixture is preserved from the action of the air by a layer of turpentine; ammonia is then added, and the fluid is immediately rendered brown by the oxidation of the pyrogallic acid. It is again rendered colorless by the addition of a solution of zinc chloride. The quantity of the zinc chloride required constitutes a measure of the quantity of the oxidised pyrogallic acid. The zinc chloride solution contains 1.4 grammes of zinc in 100 ccm. This quantity corresponds to 2 milligrammes of pyrogallic acid. For the estimation of the oxygen, Freise depends on an experiment of Döbereiner, according to which 1 gramme of pyrogallic acid in an ammoniacal solution absorbs 260 ccm. of oxygen.

## NEW CAUTERY.

A new cautery seems to attract much attention in Paris. It is the invention of Dr. Paquelin. The accounts of it which have appeared do not give the details of its construction, but it appears to resemble in some particulars the gas cautery employed some years ago in London by the late Mr. A. Bruce. The principle of its construction is, that platinum, or a similar metal, heated to a certain point, becomes instantly incandescent in contact with a gaseous mixture of air and certain hydrocarbon vapors; and that this incandescence is maintained as long as the platinum and the gas are in contact. With 200 grammes of liquid five hours' work can be done. Any temperature can be maintained steadily, from a dull-red to a brilliant-white heat, and can be instantly varied. Organic liquids, even cold water, do not, it is said, interfere with its activity.

## LINGUAL PSORIASIS AND EPITHELIOMA.

SIR JAMES PAGET pointed out, in some remarks at a meeting of the Medical and Chirurgical Society in 1864, that lingual psoriasis may terminate in epithelioma. This observation was confirmed by Mr. Hulke, Mr. Morris, and M. Trélat last year, and more recently by M. Fredet, who described a well-marked case to the Société de Chirurgie of Paris. The patient was a man of fifty years of age, a great smoker, on whose tongue patches of psoriasis appeared, followed after a time by induration and well-marked epithelioma, to which, an operation being refused, the patient ultimately succumbed.

**ALUM, TANNIN, AND OXIDE OF ZINC IN STICKS.**—When these substances are to be carried into the neck or body of the uterus, they are liable to break and become troublesome. It has been attempted to incorporate them with glycerine, but unsuccessfully. M. Duquesnel is using gutta-percha, which he mixes with the medicinal substance by means of heat. Whilst the combination is still hot it is rolled into cylinders a few lines thick, which harden on cooling. It remains to be proved that the astringent effects are not hindered by the gutta-percha.

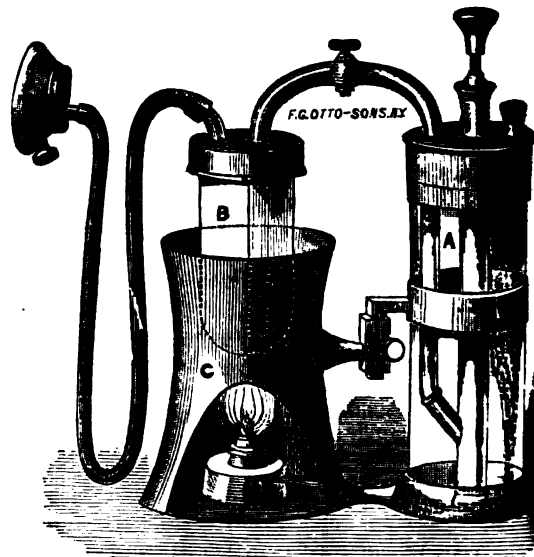
## New Inventions

IN AID OF THE

## PRACTICE OF MEDICINE AND SURGERY.

## NEW ETHER INHALER.

MESSRS. SALT & SON, surgical instrument manufacturers, of Birmingham, send us a description of a new inhaler, devised by Mr. Lawson Tait, and manufactured by them. The advantages claimed for this apparatus are, that pure ether vapor can be given at the temperature of the blood, and unmixed with air, so that the production of anaesthesia is more rapid and agreeable than if induced by ether in the ordinary way; there is also no risk of bronchitis, which is sometimes induced by the intense cold resulting from the vaporisation of ether.

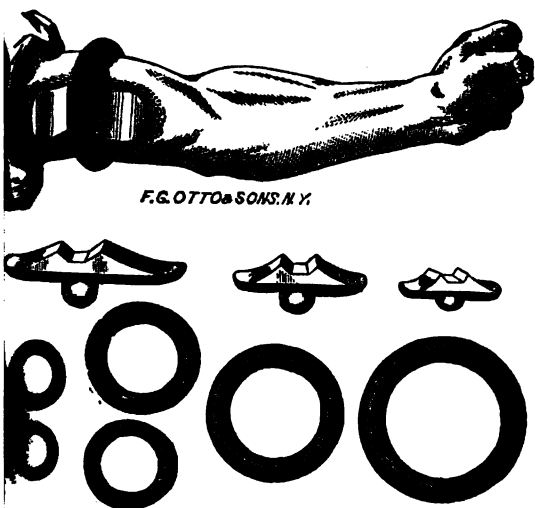


The apparatus, as will be seen by the engraving, is composed of glass and metal, with an elastic tube and vulcanite mouth-piece. The larger glass vessel contains the stock; the smaller one, a small quantity of ether, to be evaporated by immersion in a hot-water bath, the heat being maintained by means of a spirit lamp underneath. The ether is supplied to the smaller vessel by means of a spring pump, which injects from the stock bottle, from time to time, as much as is required, and is entirely under the control of the administrator.

## AN IMPROVED APPLIANCE FOR BLOOD-LESS OPERATIONS.

MANY surgeons who practise bloodless operations must have noticed the inconvenience of Esmarch's bandage in these points—viz., there is some trouble in adjusting it at the commencement of rolling, more in fixing it when the limb is rolled, and a tourniquet or extra band is necessary to control the main artery. Mr. H. L. Browne, surgeon to

the West Bromwich Hospital, proposes the following appliance to remedy these defects. It consists of wooden plugs and elastic india-rubber rings of different sizes and thickness. A suitable ring is chosen, rolled along the limb and over a plug placed on the main artery. The blood is thereby entirely compressed out of the limb, and is kept out as long as is wished. Round the wrist, ankle, fingers, and toes, the pressure of the ring alone is sufficient. It may be used as an ordinary tourn-



quet by *stretching* instead of rolling the ring over the limb and plug. The rings are made of six sizes and the plugs of three, and may be procured in sets from Messrs. Salt and Son, of Birmingham. The plug as represented in the diagram is much too large, as the smallest of the three sizes is generally sufficient, for the brachial, whilst the largest provides for any ordinary amount of obesity.

#### THE EFFECT OF PROLONGED MUSCULAR EXERCISE ON THE SYSTEM.

By F. W. PAVY, M.D., F.R.S.

(Continued from July No., p. 336.)

This month I have to communicate the results obtained during Weston's six days' walk, but before doing so there are two points to which it is advisable I should refer.

The first is as regards a statement made by Mr. Ashburton Thompson, in the last number of the *British Medical Journal*, which has thrown discredit on the validity of the investigations I have been conducting. The assertion is made that Mr. Weston has been in the habit of chewing certain dried leaves, those of the *Erythroxylon coca*, whilst pursuing his route, for the purpose of increasing his power of sustaining prolonged exertion. A somewhat lengthy dissertation is introduced about the properties and effects of these leaves upon the system, and it is suggested, upon

the strength of a two-days' observation quoted, that they retard tissue waste, and diminish the elimination of urea—circumstances, it is affirmed, which must be taken into consideration before drawing any conclusions from the analysis of Weston's urine, now in course of publication.

It is to be regretted that, before advancing such a proposition, Mr. Thompson did not obtain more precise information. Already his statement has been copied into the public journals, and various kinds of comments made. The fact is that Mr. Weston chewed some of the leaves in question during his first or twenty-four hours' walk, but only then. He has positively asserted, and this in the presence of Mr. Thompson, and the assertion is confirmed by his attendants, that not a single leaf was introduced into his mouth during either of his subsequent walks. It happens that in connexion with the first walk, my examination of the day's urine was only complete in the case of Weston's competitor. Through a mishap I was prevented from obtaining Weston's urine voided during the walk, and only procured a specimen passed an hour afterwards. It was not until the subsequent walking performances that my investigations assumed a systematic shape, and here, as stated, no invalidating influence on the cocoa-leaf hypothesis existed.

The other point has reference to the actual distance walked. From communications I have received I have learnt that a doubt exists in the minds of some regarding the reality of the distance named having been walked. It may be said, however, that the arrangements are such throughout as to preclude the possibility of any misrepresentation being made. If there is one thing more than another that may be relied upon, it is that the number of miles recorded are actually walked.

My last account embraced the observations conducted during the six days prior to the six-day walk. At a few minutes after midnight of Sunday, March 5, Mr. Weston started, sanguine of being able to walk 500 miles before midnight of the following Saturday. Although then appearing well, yet during a part of the preceding week he had been feverish and weak from the cold under which he had labored. This doubtless contributed to his failure in accomplishing more than 450 miles. Each day, indeed, the distance walked fell short of what he ought to have traversed to have succeeded in his undertaking. He did not become leg-tired or foot-sore, but appeared to possess a want of the proper amount of power to keep him going for the requisite time every day and with the requisite speed. It was more nervous than muscular exhaustion that was noticeable. In the absence of excitement he became drowsy, and sometimes experienced a great difficulty in keeping himself awake on the track. After an ordinary night's rest, when his task was finished, he got up and went about as though nothing unusual had been undertaken.

The food consumed upon this occasion comprised a much larger supply of solid material than had hitherto been taken. During the first day it was chiefly of a liquid nature, but afterwards the diet more and more consisted of ordinary food consumed at stated periods. The account was taken for me by Messrs. Brett and Hinton, of Guy's Hospital, to whom I am indebted for the assistance rendered.

Weight (without clothes) one hour and a half before starting, 8 st. 11 lb. 12 oz.; pulse 72; temperature in mouth, 99° 6.

*First twenty-four hours of the six-day walk.*—Distance walked, 90 miles. Amount of urine passed, 2356·9 c.c. (83 oz.); specific gravity, 1026·7; free acidity, reckoned as oxalic acid, 1·45 grammes in 1000 c.c. (·635 grain in 1 oz.); amber color, clear. Microscopic characters: a few crystals of uric acid. Composition in 1000 parts:—

|                                  |        |
|----------------------------------|--------|
| Water                            | 952·52 |
| Solid residue (dried at 240° F.) | 47·48  |

Incinerated residue ... 15·14

Organic constituents—

|           |       |
|-----------|-------|
| Urea      | 28·73 |
| Uric acid | 1·95  |

Other organic matters ... 1·66—32·34

Mineral constituents—

|                 |           |
|-----------------|-----------|
| Chlorine...     | 2·85      |
| Sulphuric acid  | 2·08      |
| Phosphoric acid | 2·82      |
| Soda            | 4·06      |
| Potash          | 3·06      |
| Lime            | ·17       |
| Magnesia        | ·08       |
| Loss            | ·02—15·14 |

47·48

Total quantity of solids excreted during the twenty-four hours:—

|                       |                                 |
|-----------------------|---------------------------------|
| Urea                  | 69·581 grammes (1072·88 grains) |
| Uric acid             | 4·714 „ (72·67 „ )              |
| Other organic matters | 4·007 „ (61·88 „ )              |
| Chlorine              | 6·929 „ (106·98 „ )             |
| Sulphuric acid...     | 5·044 „ (77·15 „ )              |
| Phosphoric acid       | 6·835 „ (105·39 „ )             |
| Soda                  | 9·729 „ (151·13 „ )             |
| Potash...             | 7·401 „ (114·18 „ )             |
| Lime                  | ·424 „ (6·48 „ )                |
| Magnesia              | ·212 „ (3·24 „ )                |

*Food consumed:* Cooked meat, 3 oz. (underdone roast beef); 5 yolks of eggs; jelly, 2 pints; Liebig's extract, 1½ oz. by weight, taken as beef-tea; Brand's essence of beef, 1 oz. by weight; milk, 2½ pints; sea-moss farina blanc-mange, 2½ pints; oatmeal, 5½ oz. in the form of gruel; biscuits (Huntley and Palmer's), 2½ oz.; bread, in form of dry toast, 1 oz.; coffee, 2½ oz.; tea, ½ oz.; sugar, 8 oz.; grapes, 1½ lb.; 6 oranges.

Weight, without clothes, at the end of the twenty-four hours, 8 st. 9 lb. 12 oz.

*Second twenty-four hours of the six-day walk.*—Distance walked, 77 miles. Amount of urine passed, 1789 c.c. (63 oz.); specific gravity, 1029·4; free acidity, reckoned as oxalic acid, 2·52 grammes in 1000 c.c. (1·10 grains in 1 oz.) Turbid from copious deposit of lithates. Microscopic characters: Amorphous lithate of soda, with a few crystals of oxalate of lime. Composition in 1000 parts:—

|                                  |        |
|----------------------------------|--------|
| Water                            | 986·71 |
| Solid residue (dried at 240° F.) | 63·29  |

Incinerated residue ... 11·21

Organic constituents—

|           |       |
|-----------|-------|
| Urea      | 43·21 |
| Uric acid | ·99   |

Other organic matters ... 7·88—52·08

Mineral constituents—

|                 |      |
|-----------------|------|
| Chlorine...     | ·49  |
| Sulphuric acid  | 2·26 |
| Phosphoric acid | 3·25 |
| Soda            | 1·24 |
| Potash          | 8·82 |
| Lime            | ·20  |
| Magnesia        | ·09  |

11·21

Less excess ... 7

63·29

Total quantity of solids excreted during the twenty-four hours:—

|                       |                                 |
|-----------------------|---------------------------------|
| Urea                  | 79·610 grammes (1228·23 grains) |
| Uric acid             | 1·825 „ (28·10 „ )              |
| Other organic matters | 14·491 „ (223·58 „ )            |
| Chlorine              | ·912 „ (14·04 „ )               |
| Sulphuric acid...     | 4·168 „ (64·34 „ )              |
| Phosphoric acid       | 5·993 „ (92·43 „ )              |
| Soda                  | 2·326 „ (35·79 „ )              |
| Potash...             | 7·049 „ (60·80 „ )              |
| Lime                  | ·375 „ (5·71 „ )                |
| Magnesia              | ·179 „ (2·76 „ )                |

*Food consumed:* Cooked meat 1 lb. 6½ oz. (lean of chop, boiled chicken, and minced chicken); 3 yolks of eggs; 4 poached eggs; jelly 1 pt. 8 oz.; beef-tea from fresh meat ½ pt.; Liebig's extract 4½ oz. by weight, taken as beef-tea; Brand's essence of beef 1½ oz. by weight; milk 1½ pts.; oatmeal 8½ oz. in the form of gruel; bread 3 oz. in form of dry toast; bread spread with butter 2½ oz.; potatoes 3 oz.; coffee 2½ oz.; tea 1 oz.; sugar ½ lb.; grapes ½ lb.; 1½ oranges.

Body-weight at the end of the twenty-four hours, 8 st. 9 lb. Temperature in mouth, 99° 6.

*Third twenty-four hours of six-day walk.*—Distance walked, 70½ miles. Amount of urine passed, 1732·2 c.c. (61 oz.); specific gravity, 1030·4; free acidity, reckoned as oxalic acid, 2·4 grammes in 1000 c.c. (·96 grain in 1 oz.) Turbid from copious deposit of lithates. Microscopic characters: Amorphous lithate of soda, and uric acid crystals. Composition in 1000 parts:—

|                                  |        |
|----------------------------------|--------|
| Water                            | 984·97 |
| Solid residue (dried at 240° F.) | 65·03  |

Incinerated residue ... 8·82

Organic constituents—

|           |       |
|-----------|-------|
| Urea      | 45·82 |
| Uric acid | 1·56  |

Other organic matters ... 8·88—56·21

Mineral constituents—

|                 |      |
|-----------------|------|
| Chlorine...     | ·17  |
| Sulphuric acid  | 3·41 |
| Phosphoric acid | 2·53 |
| Soda            | 1·02 |
| Potash          | 2·06 |
| Lime            | ·14  |
| Magnesia        | ·06  |

8·92

Less excess ... 57

65·03

Total quantity of solids excreted during the twenty-four hours:—

|                                |                                 |
|--------------------------------|---------------------------------|
| Urea ...                       | 81.404 grammes (1256.00 grains) |
| Uric acid ...                  | 2.771 „ (42.74 „ )              |
| Other organic mat-<br>ters ... | 15.752 „ (243.02 „ )            |
| Chlorine ...                   | .329 „ (5.09 „ )                |
| Sulphuric acid...              | 6.062 „ (93.50 „ )              |
| Phosphoric acid                | 4.503 „ (69.48 „ )              |
| Soda ...                       | 1.818 „ (29.08 „ )              |
| Potash ...                     | 4.055 „ (70.21 „ )              |
| Lime ...                       | .259 „ (4.01 „ )                |
| Magnesia ...                   | .121 „ (1.85 „ )                |

*Food consumed:* Cooked meat, 1½ lb. (lean of chop, boiled chicken, and minced chicken); 8 yolks of eggs; 2 poached eggs; jelly, 2 pts.; beef-tea from fresh meat, ¼ pt.; Brand's essence of beef, 5½ oz. by weight; oatmeal, 8½ oz. in the form of gruel; bread, 4 oz., in the form of dry toast; bread, 8 oz.; milk, 8½ pts.; potatoes, 6 oz.; coffee, 2½ oz.; tea, 1 oz.; sugar, 8 oz.; black currant jelly, 2 oz.; grapes, ½ lb.; 1½ oranges.

Body-weight at the end of the twenty-four hours, 8 st. 9 lb. 8 oz. Temperature in mouth, 99.7°.

*Fourth twenty-four hours of six-day walk.*—Distance walked, 76½ miles. Amount of urine passed, 1789 c.c. (68 oz.); specific gravity, 1029.2; free acidity, reckoned as oxalic acid, .63 gramme in 1000 c.c. (.275 grain in 1 oz.); turbid from copious deposit of lithates. Microscopic characters: Amorphous lithate of soda. Composition in 1000 parts:—

|                                  |        |
|----------------------------------|--------|
| Water ...                        | 943.39 |
| Solid residue (dried at 240° F.) | 56.61  |

Incinerated residue ... 10.36

|                                |            |
|--------------------------------|------------|
| Organic constituents—          |            |
| Urea ...                       | 36.89      |
| Uric acid ...                  | 1.46       |
| Other organic mat-<br>ters ... | 7.90—46.25 |
| Mineral constituents—          |            |
| Chlorine...                    | .50        |
| Sulphuric acid ...             | 2.28       |
| Phosphoric acid                | 2.43       |
| Soda ...                       | 3.01       |
| Potash ...                     | 2.43       |
| Lime ...                       | .27        |
| Magnesia ...                   | .06        |

Less excess ... .62—10.36

56.61

Total quantity of solids excreted during the twenty-four hours:—

|                                |                                 |
|--------------------------------|---------------------------------|
| Urea ...                       | 67.982 grammes (1048.93 grains) |
| Uric acid ...                  | 2.683 „ (41.36 „ )              |
| Other organic mat-<br>ters ... | 15.278 „ (235.74 „ )            |
| Chlorine ...                   | .930 „ (14.85 „ )               |
| Sulphuric acid...              | 4.204 „ (64.81 „ )              |
| Phosphoric acid                | 4.472 „ (68.97 „ )              |
| Soda ...                       | 5.546 „ (84.86 „ )              |
| Potash ...                     | 4.472 „ (68.97 „ )              |
| Lime ...                       | .51 „ (7.87 „ )                 |
| Magnesia ...                   | .125 „ (1.93 „ )                |

*Food consumed:* Cooked meat 1 lb. 3 oz. (lean of chop, boiled chicken and minced chicken); 1 yolk of egg; jelly 1½ lb.; beef-tea from fresh meat ¼ pint; milk 2½ pints; bread 8 oz., in the form of dry toast; bread 6 oz.; butter 2 oz.; potatoes 6 oz.; coffee 6½ oz.; tea 1½ oz.; sugar 5½ oz.; black currant jelly 8 oz.; grapes 1 lb.; 1½ oranges.

Body-weight, at the end of the twenty-four hours, 8 st. 8 lb. 1 oz. Temperature in mouth, 99.5°.

*Fifth twenty-four hours of the six-day walk.*—Distance walked, 67 miles. Amount of urine passed, 1476.6 c.c. (52 oz.); specific gravity, 1031.06; free acidity, reckoned as oxalic acid, 1.89 gramme in 1000 c.c. (.82 grain in 1 oz.); exceedingly turbid from deposit of lithates. Microscopic characters: Lithate of soda, uric-acid crystals. Composition in 1000 parts:—

|                                  |        |
|----------------------------------|--------|
| Water ...                        | 941.32 |
| Solid residue (dried at 240° F.) | 58.68  |

Incinerated residue ... 14.55

|                                |            |
|--------------------------------|------------|
| Organic constituents—          |            |
| Urea ...                       | 40.25      |
| Uric acid ...                  | 1.06       |
| Other organic mat-<br>ters ... | 2.82—44.18 |
| Mineral constituents—          |            |
| Chlorine...                    | 3.12       |
| Sulphuric acid ...             | 1.85       |
| Phosphoric acid                | 2.76       |
| Soda ...                       | 3.78       |
| Potash ...                     | 2.23       |
| Lime ...                       | .23        |
| Magnesia ...                   | .09        |
| Loss ...                       | .49—14.55  |

58.68

Total quantity of solid matter excreted:—

|                                |                                |
|--------------------------------|--------------------------------|
| Urea ...                       | 61.295 grammes (945.84 grains) |
| Uric acid ...                  | 1.772 „ (26.23 „ )             |
| Other organic mat-<br>ters ... | 4.283 „ (66.04 „ )             |
| Chlorine ...                   | 4.756 „ (73.29 „ )             |
| Sulphuric acid ...             | 2.821 „ (43.51 „ )             |
| Phosphoric acid                | 4.209 „ (64.96 „ )             |
| Soda ...                       | 5.760 „ (88.87 „ )             |
| Potash ...                     | 3.897 „ (52.31 „ )             |
| Lime ...                       | .340 „ (5.24 „ )               |
| Magnesia ...                   | .096 „ (1.43 „ )               |

*Food consumed:* Cooked meat, 1 lb. 11½ oz. (lean of chop, boiled chicken, and minced chicken); 1 yolk of egg; jelly ¼ pt.; beef-tea from fresh meat, 1 pt.; Liebig's extract 3 oz. by weight, taken as beef-tea; milk ¼ pt.; sea-moss farina blanc mange ¼ pt.; oatmeal 4 oz., in the form of gruel; bread 2 oz., in the form of toast; bread 10 oz.; butter 8 oz.; rice pudding made with milk and sugar, 2 oz. by weight; coffee 8½ oz.; tea 1½ oz.; sugar 2½ oz.; black currant jelly 8½ oz.; grapes ½ lb.; prune tea ¼ pt.

Body-weight at the end of the twenty-four hours, 8 st. 7 lb. 4 oz. Temperature in mouth 98.8°.

*Sixth twenty four hours of the six-day walk.*—Distance walked, 63 miles. Amount of urine passed, 1618.6 c.c. (57 oz.); specific gravity, 1031.6; free acidity, reckoned as oxalic acid, .63

gramme in 1000 c.c. (.27 grain in 1 oz.); turbid from copious deposit of lithates. Microscopic characters: Amorphous lithate of soda. Composition in 1000 parts:—

|                                  |        |
|----------------------------------|--------|
| Water                            | 942.58 |
| Solid residue (dried at 240° F.) | 57.42  |

Incinerated residue ... 15.52

Organic constituents—

|                       |       |
|-----------------------|-------|
| Urea                  | 88.31 |
| Uric acid             | .97   |
| Other organic matters | 2.62  |
|                       | 41.90 |

Mineral constituents—

|                 |      |
|-----------------|------|
| Chlorine...     | 5.52 |
| Sulphuric acid  | 1.10 |
| Phosphoric acid | 2.72 |
| Soda            | 4.07 |
| Potash          | 2.42 |
| Lime            | .25  |
| Magnesia        | .09  |

Less excess ... .65—15.52

57.42

Total quantity of solids excreted during the twenty-four hours:—

|                       |                                |
|-----------------------|--------------------------------|
| Urea                  | 63.950 grammes (985.98 grains) |
| Uric acid             | 1.618 „ (25.96 „ )             |
| Other organic matters | 4.533 „ (69.48 „ )             |
| Chlorine              | 9.228 „ (142.41 „ )            |
| Sulphuric acid        | 2.007 „ (30.86 „ )             |
| Phosphoric acid       | 4.533 „ (69.48 „ )             |
| Soda                  | 6.799 „ (104.92 „ )            |
| Potash                | 4.047 „ (62.84 „ )             |
| Lime                  | .421 „ (6.48 „ )               |
| Magnesia              | .162 „ (2.47 „ )               |

**Food consumed:** Cooked meat, 1 lb. 12 oz. (lean of chop, boiled chicken, and minced chicken); jelly,  $\frac{1}{2}$  pt.; milk,  $\frac{1}{2}$  pt.; oatmeal, 1 oz. in the form of gruel; bread, 8 oz.; butter,  $2\frac{1}{2}$  oz.; potatoes, 1 oz.; baked custard pudding, 17 oz. by weight; coffee,  $1\frac{1}{2}$  oz.; tea,  $1\frac{1}{2}$  oz.; black currant jelly, 8 oz.

Body-weight, without clothes, at the end of the twenty-four hours, 8 st. 6 lb. 7 oz. Temperature in mouth, 99.6°.

(To be concluded.)

## News Items, Medical Facts, &c.

**CYSTICERCUS IN THE EYE.**—At a recent meeting of the Berlin Medical Society the question of cysticercus in the eye was discussed. Whilst it was contended that the duration of life of the entozoon in the human eye was not extended over more than one year or a year and a half when it became encysted in the vitreous body, observations of the late Professor von Graefe and others were cited, according to which the cysticercus may remain active for a period of six or seven years. Professor Lewin, in a lecture on Cysticercus of the Skin, declared in favor of spontaneous migration of the hydatid worm, in opposition to the opinion of another member, who assumed the theory of passive locomotion by the blood-current. Von Graefe observed in two patients

cerebral symptoms which disappeared when the cysticercus made its appearance in the eye, and in one case he saw cerebral disorder a year after the entozoon had entered the eye. Unstriated muscular fibres in the neck and in the membrane of the caudal vesicle enable the worm to move like the trichina. Von Graefe's description of the mode in which the cysticercus "broke into the vitreous body" also supports the theory of spontaneous motion. He states "that the spot of irruption into the interior of the eye may be anywhere, and is pretty often in the upper half of the visible background." The subsequent lowering in the corpus vitreum takes place in a diagonal direction, not simply by the law of gravitation. The case of a woman was cited in whom the entozoon had been found twenty years ago, and who had since served as a subject for ophthalmoscopic demonstrations in the Breslau Medical School.

**A KNIFE-BLADE LYING FOR YEARS IN THE PLEURAL CAVITY.**—Dr. Bleiweis mentions in the *Memorabilia*, first part of 1876, that a prisoner in the gaol of Leibach died after a few month's illness, without presenting any striking pectoral symptoms, save hæmoptysis and fetid smell from the bronchi. The decease occurred after four years' imprisonment, and seven years after a scuffle in which the prisoner had been stabbed in the back. On a post-mortem examination, tubercular cavities were found in the lungs; and whilst the gentleman busy with the autopsy was endeavoring to loosen the adhesions of the left lung, he exclaimed that he had cut himself, and found his finger bleeding. On carefully examining the pleural cavity, a knife-blade was discovered, three inches long and half an inch wide. It was jammed between the third and fourth rib, just by the inner border of the scapula, the edge lying towards the lung. The blade was very rusty, and surrounded by a cyst formed by the thickened pleura. As stated above, it must have lain in the chest at least seven years, and the patient never mentioned anything connected with the stab.

**CHLORAL IN LABOUR.**—The value of chloral during labour was the subject of a late discussion at the Société de Médecine de Paris. M. Polaillon maintained that it was of use only to combat irregular contractions, and that in general, instead of allaying pain and permitting delivery, it only relieves suffering by arresting labour. The conclusions were founded upon its use in eighteen cases, in none of which had hæmorrhage occurred, so that the use of chloral did not appear to increase the liability to hæmorrhage. The sedative influence of chloral in these cases he believed to be more profound than that of chloroform. In one case chloroform was given after sixty grains of chloral had been taken, but without noticeable consequences. In cases of threatened abortion he had not found it so good as opium, but a combination of chloral and opium had been given with advantage by M. Charrier. From the discrepancy of opinion as to the effect of chloroform upon the uterine pains, it would appear that chloroform is less frequently employed during labour in France than in England. The chloral was given by injection, as much as seven or eight grammes having been in some cases administered.

**A SENSIBLE PRECAUTION.**—When lunar caustic is used in the oral cavity, and towards the tonsils and larynx, fears may be entertained that the stick may break and cause dangerous symptoms. To make such an unpleasant accident impossible, Dr. Mettenksimer places the caustic in a little bag of gauze, through the meshes of which the former acts completely, the escape of the stick being effectually prevented. Of course the gauze should be changed at each cauterisation, as the meshes are liable to get obstructed by moisture, and even to be destroyed by the caustic.

**ADMINISTRATION OF CROTON OIL.**—M. Robert advises a drop to be placed on a lump of sugar, the latter to be triturated and divided into several parts. Let one part be given every hour in some almond emulsion, when the patient, from some injury to the head, swallows with difficulty.

PRINTED AND PUBLISHED BY

WM. C. HERALD, Nos. 52 & 54 JOHN ST., NEW YORK.

# THE LANCET.

A Journal of British and Foreign Medicine, Physiology, Surgery,  
Chemistry, Criticism, Literature, and News.

JAMES G. WAKLEY, M.D., M.R.C.S., EDITOR.

PUBLISHED MONTHLY.

No. 9. NEW YORK, SEPTEMBER, 1876.

## Lectures

ON

### QUESTIONS IN OPHTHALMIC SURGERY.

*Delivered at the Royal College of  
Surgeons,*

By R. BRUDENELL CARTER, F.R.C.S.,

Hunterian Professor of Surgery and Pathology to the College,  
and Ophthalmic Surgeon to St. George's Hospital.

#### LECTURE I.—PART I.

##### OPHTHALMOLOGY IN ITS RELATION TO GENERAL SURGERY.

MR. PRESIDENT,—The first duty of any Fellow of this College, who, by the favor of the Council, has been permitted to undertake the task which devolves upon me to-day, must surely be to give utterance to his deep sense of thankfulness for the signal honor which has been conferred upon him. On the present occasion, Sir, this duty is more than usually imperative and binding; because the circumstances which call it into existence are in themselves a departure from precedent, and are a departure of such a kind that the honor is not limited to the individual who receives it, but extends also to the class of which he is an unworthy representative. The Hunterian Professor may often have been one whose general eminence in our art has, to a certain extent, been overshadowed by his pre-eminence in some chosen field of labor; but, I believe, the office has never before been held by any surgeon whose hospital and private practice were alike limited to a single department. I venture to think, therefore, that I stand here to-day as in some degree a representative of specialism and of specialists; and on this ground I shall hope to be pardoned if I devote a short time, by way of preface, to the consideration of special practice from the point of view of those who follow it; and if I endeavor to show under what circumstances, within what limits, and for what reasons, it should either be fostered or discouraged. The problem that these few words convey is one which

presses for solution; for the prevailing tendency to the multiplication of departments of practice, and to the consequent multiplication of hospitals which are designed to afford relief to the diseases of separate organs, if it be not essential to a division of labor which has been rendered necessary by the progress of science, can hardly be otherwise than hurtful, alike to the profession and to the public at large. Whichever it may be, it is of high importance that its true character should be clearly understood, and that the general policy of the profession should be governed accordingly.

The grounds on which specialism commends itself to patients, and is thus, in a certain sense, forced upon some who would not adopt it willingly, are so simple that they are almost self-evident. The shortness of time, and the limitation of the human faculties, are only too well known to all of us; and from these data it is assumed that the average intellect cannot be expected to embrace the whole circle of the healing art, but that it must be content, especially if it aims at any high standard of excellence, to confine itself within the boundaries of a single segment. The somewhat arbitrary division between medicine and surgery, logically indefensible although practically convenient, offers to the public an apparently plausible basis for specialism—a basis which seems to them to be only legitimately extended by the process of mapping out the body into several distinct domains, each of which is to be placed under the charge of a separate order of practitioners. It would be impertinent, before such an assembly as this, to dwell upon the absurdities of what may be called the popular view of the subject; but it may be not altogether useless to seek to direct your attention to the twofold influence upon medical knowledge and practice, to the beneficial and to the hurtful influence, of even that form of specialism which, by common professional consent, is held to be legitimate, or even necessary. The time at my disposal would not permit me, even if the attempt were desirable, to enter at all into the history of the origin of the present partial separation of ophthalmology from other portions of the healing art; and I must be content to begin my retrospect at a period to which my own memory will reach back. In 1849, when I entered as a student at the London Hospital, Sir Thomas Watson had already published those lectures on Medicine



which, even when regarded by the light of subsequent discoveries, must always form an imperishable monument to his fame. Most of those who hear me will remember how forcibly he recommended the study of the diseases of the eye to his pupils; telling them that the organ, by reason of its accessibility to examination, and by reason of the transparency and of the variety of the structures entering into its composition, might be looked upon as a legible epitome of the human frame and of its maladies. He used the phenomena of conjunctivitis to illustrate the course of inflammation of the mucous lining of the bronchial tubes, and the phenomena of iritis to illustrate the progress of pleurisy. Dr. Latham, and, in this College, Mr. (afterwards Sir William) Lawrence, had taught similar doctrines; and, even then, before the discovery of a means of inspecting the interior of the eye had arisen to render the truth of these doctrines as obvious as at present, they were, at least in theory, very generally accepted. But, in practice, the means of instruction were lamentably deficient. During my own studentship I never saw in the hospital a single case of eye disease; and the absence of living examples greatly diminished the usefulness of the lectures, part of the general course on surgery, which were devoted to the subject. The pupils who desired a more extended knowledge of ophthalmic maladies than the hospital would afford were advised to seek that knowledge at Moorfields; but it was scarcely possible to do so until after the curriculum had been completed and the ordinary examinations passed. When this was done, the demands of real life often became pressing, and Moorfields was too commonly left unvisited, except by those who were forced thither by the regulations of the public services. The general result may be illustrated by a single example. In the summer of 1856 I was stationed at Eupatoria, in the Crimea, together with some half-dozen other young men, who all held local rank as staff-surgeons in the British army, and who were all capable of tying an artery or of setting a fracture. I had the misfortune, as I then thought it, the good fortune, as it afterwards turned out, to be attacked by smart inflammation of one eye. I had no conception what was the matter with me, or what would be its probable issue; and among my colleagues there was not one who was any better informed than myself. I realised, for the first time, that absolute ignorance about eye disease was disgraceful, and determined that, when I returned home, I would not be content with a barren repentance, but that I would also endeavor to amend. To the pursuit of this resolution I am indebted for the privilege of addressing you to-day.

In the meantime, Sir, while such was the state of general professional acquaintance with ophthalmic subjects, there were a few men whose attention had been early called to them by special opportunities. It was the misfortune of these men, by reason of the prevailing indifference to their department of practice, that they were not stimulated in the direction of truly scientific work by the force of an enlightened professional opinion; and partly on this account, with some notable and honored exceptions whom it would be superfluous to name, they developed a remarkable tendency to expend their mental energies in the invention of hard words—words the meaning of which was by no means self-evident, and which were not always

intelligible even when they were explained. In those days, more than one treatise upon eye disease was furnished with a glossary of terms, such as we may often find appended to a collection of ballads written in a provincial dialect. The protrusion of a minute portion of iris through an aperture in the cornea was called "myocephalon." Inflammation of the retina, at that time only a conjectural condition, was called "amphiblesoriditis," although amphibleston, instead of being equivalent to *rete*, signifies a large seine or dragnet. Perhaps the worst coinage of all was a word of no less than twenty-nine letters, "dacrycystosyngokatakleleia," which was employed to denote an operation for the cure of obstruction of the tear passage. There can be no doubt, I think, that the portentous vocabulary from which the foregoing examples have been culled must have furnished an apt illustration of Dr. South's happy phrase, "the terrible imposture and force of words," and that it must have exercised a most deterrent influence upon a large number of medical practitioners and students. There surely needs no evidence that those who framed it must have been incapable of working in a manner calculated to increase true knowledge. It is our fortunate lot to have survived to a time at which there is a more just appreciation of the relative values of words and things.

When the late Mr. Charles Babbage invented the ophthalmoscope, and was so unfortunate as to submit his invention to an adviser who failed to perceive its value, the dawn of a brighter day was at hand. Four years later, Helmholtz repeated the invention in a slightly different form; and Roete, soon afterwards, reproduced Babbage's original instrument, by which that of Helmholtz has long been superseded for most purposes. More fortunate than our countryman, Helmholtz and Roete cast the fruits of their labors upon fertile ground, which has yielded a harvest of unexampled abundance. Partly because the instrument was first made known in Germany, and partly, perhaps, because the state of medical education in that country offers many facilities for the prosecution of original research, it was in Germany that the first important results were obtained. The English specialists, with certain exceptions, approached the ophthalmoscope with much timidity, and were still restrained by fears about the possibly hurtful consequences of its illumination, when the Germans had already laid down the chief outlines of the new territory into which they were admitted. The instrument, moreover, required for its intelligent employment a certain knowledge of elementary geometry; and, as this knowledge forms with us no necessary part of preliminary medical education, it chanced to be conspicuously absent in the case of some of those whose opportunities of doing ophthalmoscopic work were most extended, and to whom, consequently, the profession were entitled to look for the earliest intelligence about the new method of research. The question whether the image of the fundus oculi was erect or inverted was gravely discussed without any apparent knowledge of the conditions which would produce one or other of these states; and sometimes as if it were a matter which could only be settled by a process of ingenious guessing. For a long period, in this country, the literature of the subject was unpleasantly fragmentary and chaotic, and even now, as a sort of survival of that period, there

lingers a belief that the ophthalmoscope, which is really the most simple of all instruments of physical diagnosis, is something recondite in principle and difficult of application in practice. I regret to add that the influence of this most pernicious error is still very manifest in many of our schools of medicine.

In the meanwhile, the actual pioneers of ophthalmoscopic research had made discoveries which revolutionised the pre-existing notions with regard to many of the diseases of the eye, and which, at the same time, cleared up the obscurity which had enveloped the nature of many of its functional defects. The diagnosis of cataract, previously very doubtful and obscure, was placed upon a basis of physical certainty, from which all doubt was for ever after excluded. The nature of the conditions generically termed Glaucoma was ascertained, and the way was thus opened for their successful treatment. The impaired vision of Bright's disease and of other maladies, which had formerly been attributed to the imperfect nerve-action excited by depraved or poisoned blood, was shown to be dependent upon physical changes in the retina; and the discovery threw new light upon many analogous conditions. The states collectively called *Asthenopia*, or weak sight, which had been regarded as incurable, were traced to faults in the shape or symmetry of the eyeball; faults which generally admit of complete correction by spectacles or by other optical appliances. The name "*amaurosis*," the most typical example of a word made to do duty for a fact, disappeared from ophthalmic literature; and the forms of blindness in which previously, to use Walther's poor pun, the patient saw nothing and the surgeon also saw nothing, were traced to a great variety of previously unknown or even unsuspected morbid changes. The stimulus afforded by the ophthalmoscope was by no means confined to the conditions for the elucidation of which it was required, but extended also to every department of eye disease; so that not only were all ocular phenomena observed and noted with an exactness never before attempted, but new operations and other new modes of treatment were devised and practised almost daily. On every side the old order of things was changing, giving place unto the new; and the feverish activity which prevailed may be admitted to have produced innovations which were not always improvements. Notwithstanding this, it cannot be doubted that medical science gained enormously, and that the aggregate result has been in the highest degree advantageous to mankind.

Together with these benefits, however, there sprung up two beliefs which seem to me to be alike erroneous and mischievous. The great progress of ophthalmology was by many attributed to specialism; that is, it was supposed to be a result, and even a natural result, of division of labor, or of the exclusive devotion of many minds to a single branch of the art of healing. Next, while the public were being thus confirmed in their impression that none but specialists had studied the diseases of the eye, and that general practitioners need not even be expected to study them, medical students were somehow led to believe not only that ophthalmology was exceptionally abstruse and recondite, but also that it was growing so rapidly as to be in a state of transition, and that they might wait until it became more settled before attempting to understand it. The authorities of the

various schools of medicine did their best to dispel this last delusion, by establishing departments for instruction in the subject; but as long as their efforts in this direction receive no systematic recognition from licensing bodies and from boards of examiners, it can hardly be expected that they will be rewarded by any remarkably measure of success.

For my own part, Mr. President, instead of believing that the modern progress of ophthalmology is at all a result of division of labor, I look upon it as having been the necessary consequence of the sudden acquirement of a new and complete method of research; and I am fully convinced that, instead of this progress having been promoted by specialism, it has been retarded by the influence of specialism in diminishing the number of laborers in the field, and in diminishing the opportunities of those laborers to regard the facts before them from a standpoint of general pathology. A good example of this is furnished by the clinical history of many of those forms of blindness which are produced by atrophy of the optic nerves. Oculists had long been familiar with cases in which sight slowly faded away without assignable cause; and in many of such cases it was soon discovered by the ophthalmoscope that the optic nerves were blanched and wasted, or were converted into little more than connective tissue. Post-mortem examinations showed that such changes were sometimes associated with the presence of syphilitic or other intracranial tumours; but more frequently the blindness was not attended by any definite symptoms, nor did its causes appear to have any tendency to shorten life. As long as the investigation remained in the hands of specialists, who were not consulted until the sight had become impaired, nothing was known of nerve atrophy until it was well established; and even so sound a thinker and so acute an observer as Von Graefe devoted much time to fruitless endeavors to clear up the nature of a condition which he had no opportunities of tracing back to its earliest stages. Nerve atrophy was regarded, by him and by others, as an ultimate fact; and it was only when physicians began to use the ophthalmoscope in all cases of head affection, as a means of seeing the circulation of an organ structurally continuous with the brain, that atrophy was discovered to be a common consequence of inflammation or swelling which was originally limited to the connective-tissue elements of the nerves, and which therefore might exist in a very marked degree, and might give rise to ultimately destructive changes, without at first in any way affecting the sight. The occurrence of a so-called neuritis, as a common antecedent of optic-nerve atrophy, was made known to specialists by physicians who were not specialists. I can entertain no doubt that the systematic use of the ophthalmoscope in medical and surgical practice, without any direct reference to the state of vision, would lead to many other discoveries of a similar kind, and would greatly tend to connect the early stages of many forms of eye disease with a variety of constitutional changes. As long as this means of investigation is left exclusively, or even chiefly, in the hands of men who are consulted only about defective sight, so long will the real nature and causes of many of the changes by which defective sight is produced be left to reward the labors of a future generation of practitioners.

It is worth while to remark, in this connexion, that perhaps the most important and remarkable surgical discovery of modern times—the discovery that certain affections of the cornea are due to inherited syphilis, and that they are in most cases associated with readily recognisable external signs of the inheritance—was due to a surgeon who, while better informed upon many special subjects than the majority of specialists themselves, has yet never allowed himself to be confined to any single branch either of study or of practice. Mr. Hutchinson's genius comprehends all surgery, and, like that of Goldsmith, it touches nothing which it does not adorn. His brilliant example affords demonstration, if any were needed, that the most complete mastery of the ophthalmology of the present day is at least not incompatible with an equal mastery of other branches of our art.

It would be preposterous to urge, however, that ophthalmic specialism is wholly without advantage. It is not given to all men to possess a widely embracing mental capacity, and thus it may well happen that some may do respectable work as specialists who would be unequal to the burden of wider responsibilities. Again, I entertain no doubt that it is, on the whole, advantageous to the public that the more important of the operations upon the eye should be committed to a limited number of hands. In the first place, in these delicate operations, and more especially in that for the extraction of cataract, it is scarcely possible to over-rate the value to the surgeon of having had a very large experience, such that he may be practically familiar with every complication which may arise in the course of his proceedings, and may be able to meet every such condition almost instinctively, and without hesitation or delay. Next I think that, for most persons, an equal proficiency in ophthalmic and in general operations is not attainable, the tendency of each being somewhat to spoil the hand for the requirements of the other. The habit of making incisions, the length of which has to be expressed in millimetres, can scarcely fail to engender a liability to be niggling over larger matters; and the freedom of hand, which is an important element of success in dividing the common integument, would often be disastrous if it were exercised upon the cornea. Moreover, as a last scientific basis for the advocacy of specialism, it is unquestionable that there are certain niceties of practice, alike in methods of investigation and in methods of treatment, which require the devotion of much time before they can be fully mastered, which have their legitimate uses in consultations upon difficult cases, and which would not come into play with sufficient frequency in general practice to render it worth the while of the majority of surgeons to acquire them.

But, altogether apart from science, there is yet another reason for the maintenance of ophthalmic specialism, and one which should perhaps take precedence of all others. There is an old story of a party of villagers who waited upon a Lord Chamberlain soon after a coronation, in order to explain why they had not rung their church bells in honor of the event. They feared that the newly-crowned sovereign would suspect them of disloyalty, and they declared that such a suspicion would do them great injustice, since they were provided with no less than twelve good reasons for their apparent neglect. To hear these reasons the Lord Chamberlain did seriously incline, but he

stopped the spokesman after the first of them, and assured the deputation that his Majesty would be perfectly satisfied with that one alone—it was that they had no bells in the parish. In like manner, it might be sufficient to urge, in defence of ophthalmic specialism, that the public, whose servants we are, will have it so, and that we are bound to obey them. None the less, I apprehend, should we try to obtain clear notions of the effects and tendencies of their requirements.

Now, while I admit, quite freely, that ophthalmic specialism has the advantages which I have already stated, that it is conducive to the attainment of operative dexterity, and also to the attainment of a great deal of very minute knowledge about various matters of different degrees of importance, I yet bring against it the indictment that, as hitherto suffered to exist, it tends to render a large number of students and practitioners neglectful or ocular maladies. If this be so, it follows that it must be prejudicial in a twofold manner: first, by depriving ophthalmology of the services of many workers, who would be likely, more or less, to throw light upon some of its dark places by collateral observation; and, secondly, by depriving general practitioners of the aids which an adequate knowledge of the diseases of the eye would often afford to them in other departments of their calling. In order that we may estimate these charges at their true value and significance, it seems that we should first ask ourselves what are the precise claims of eye disease upon the general attention of the profession.

With reference to this part of the subject, it is perhaps hardly necessary to speak at length of the importance of the visual function. It will be admitted at once, and as a self-evident proposition, that this function holds the very first place, as a source of human comfort and welfare, among all those which are not immediately necessary to the preservation of life. To be deprived of it, to the great majority of mankind, would be to be condemned to a state of poverty and dependence, and to lose a very large proportion of the most highly prized enjoyments of existence.

Next to the importance of the function, we may consider the number and variety of the risks to which it is exposed. Some years ago, I had occasion to compare the numbers of the patients who were treated, in hospitals, for ophthalmic and for other maladies; and I found that the ophthalmic cases, numerically regarded, constituted about one-twelfth part of the whole. Moreover, there were then twenty-four counties which contained no ophthalmic hospitals, although they contained nearly half of the extra-metropolitan population; and, on the whole, I arrived at the conclusion that patients suffering from diseases of the eyes, and treated either at ophthalmic hospitals, or at the ophthalmic departments of general hospitals, amounted to about one in every eight or nine of the hospital patients of England, whether these sought relief for medical, for surgical, or for other so-called special maladies. Hence it would appear that the profession generally, to the extent to which it fails to treat ophthalmic affections, suffers one-ninth of its opportunities of being employed to lapse into the hands of a comparatively small number of practitioners.

Approaching the subject from another point of view, some curious statistics have been compiled by Drs. Zander and Geissler, in illustration of the

liability of the eyes to sustain injury. They assume that the mean superficies of the human body is about fifteen square feet, and that the mean superficies of the orbital opening is about 180 square lines, from which it should follow, if all parts were equally exposed to injury, that injuries of an eye would bear to others the proportion of about one in 600. As a matter of fact, the actual proportion, as far as it can be ascertained, is more than twenty times as great, or about thirty-six in 1000. It need not be said that no estimates of this kind can be otherwise than approximative, but it is highly probable that any sources of error which may underlie them will tell equally on both sides of the account, and will leave a very near approach to the actual facts of the case. It may certainly be assumed, both as regards disease and injury, that every practitioner whose work is at all remote from any great centre of specialism must expect, and therefore should be fully prepared to encounter, a large proportion of ophthalmic maladies in the course of his daily practice.

## LECTURE I.—PART II.

### OPHTHALMOLOGY IN ITS RELATION TO GENERAL SURGERY.

On the foregoing lines of inquiry, Mr. President, we may arrive at some conclusions with regard to the degree of attention to ophthalmic maladies which the most barren considerations of worldly prudence would seem to suggest to the great majority of the profession. It is certain that, without a considerable amount of such attention, practitioners will constantly be liable to be confronted by cases which they have not prepared themselves to treat, and the results of which can hardly fail to be in some way injurious to their reputation. But even if we set aside these considerations, and regard the diseases of the eyes merely from the point of view of their pathological interest and importance, I think we shall find reason to conclude that they form a group which, over and above all others, should be carefully studied by those who would attain to a complete knowledge of either medicine or surgery. The weighty and well-considered words of Sir Thomas Watson and of Sir William Lawrence, to which I have already made some reference, have long ago been far outstripped by the facts; and Von Graefe could hardly have been accused of an over-statement when he said, twelve years ago, that the ophthalmic surgeon was in many respects qualified to be to his brethren at once a pioneer and an example. The earliest ophthalmoscopic investigators found themselves brought face to face with phenomena which both permitted and required a very remarkable degree of accuracy and exactitude in stating them; and this accuracy and exactitude necessarily led to observations which were commensurate in their carefulness with the precision of the language in which they were to be expressed. Step by step, this precision came to prevail in every department of ophthalmology, and among all who endeavored to keep pace with its progress, until it may now be described as the exact science of medicine. The estimation of the degrees of perception of light, the determination of the acuteness of vision by carefully graduated test-types placed at definite distances, the employment

of a strictly accurate nomenclature for the regions of the eye itself, the care that is daily taken to note all the phenomena produced by altered strength or impaired harmony of the ocular muscles,—these things may seem of small individual importance; but, when collectively considered, they constitute the difference between science and mere aptitude. They also produce a custom of recording cases in such a manner that their nature may be thoroughly understood by others without personal inspection; so that the experience of one observer may be made available for the guidance of all. It would be difficult to over-estimate the general educational value of such exactness, or its possible influence upon habits of observation and upon modes of thought. We have already seen that the eye is an organ in which the general characters common to many morbid processes are especially open to observation, and can be studied with peculiar advantage. The varieties of inflammatory action, as they occur in the eye, may be regarded as types which exhibit the essential tendencies of these processes, as they are carried on in parts more remote from observation. It does not seem chimerical to think that the way in which the types are described and studied will influence the spirit in which observations are afterwards extended over a larger area or to less accessible structures; or that the growth and diffusion of a scientific ophthalmology are calculated to become powerful agencies in promoting the increase and development of accurate observation in relation to other portions of the healing art.

If we proceed now from these general considerations to others of a more particular character, we shall find that there is hardly a structure in the eye, or a disease to which it is subject, which does not throw light upon other diseases elsewhere. In the cornea, for example, we have the processes of inflammation and ulceration fully exposed to view. In certain morbid states, we see bloodvessels with a distinctness elsewhere unattainable, and can even subject them to microscopical examination, so as to study minutely the physiology of the circulation, and the influence upon it of disease or of remedial agents. In the retina, again, we have before us a complete circulation, habitually seen under an enlargement of twenty diameters; in which we are able to observe the occurrence of many changes, such as obstruction of the veins, ischæmia of the arteries, embolism, extravasations, and others, and to follow them day by day, through all their phases, from their commencement to their results. Moreover, the circulation which is thus exposed to view is that of an organ which is actually a portion of the brain projected towards the surface, and the irregularities which it displays are of a kind liable to be repeated in the brain itself, and to work there disastrous or even fatal changes. I have met with several instances in which slight peripheral retinal hæmorrhages, scarcely or not at all affecting the sight, have yet served to give timely warning of the brittleness of the vascular system of the nervous centres, and have led to precautions which could not fail to afford increased security against an imminent danger.

The central artery of the retina, under ordinary circumstances, receives its blood in an unbroken and continuous flow. But in various states of the circulating apparatus, as in high arterial tension, and also in aortic regurgitation, an arterial pulse becomes visible in the retina. The blood either

encounters increased resistance, or it is propelled with insufficient force, and thus it only makes good its entrance during the moment when the propelling force is at the summit of its activity. Under such conditions, the ophthalmoscope and the sphygmograph furnish kindred methods of research; and there can be little doubt that increased knowledge about the influence of high arterial tension, as well as about the influence of this high tension upon local nutrition, awaits the observer who will systematically apply the ophthalmoscope to the examination of cases of arterial disturbance.

The tissue of the retina itself, wrote Von Graefe, anatomically one of the most delicate in the body, is found to possess a certain vulnerability, which predisposes it to undergo organic changes in consequence of various morbid states affecting other organs, or the mass of the blood. We see diseases of the kidney, of the heart, sclerosis of the arteries, anemia, leucæmia, syphilis, the hæmorrhagic diathesis, diabetes, and other conditions, all affecting the retina, and producing visible changes of a kind characteristic of each. The changes attendant upon Bright's disease furnish a striking illustration. At a time when the general symptoms are trivial or concealed, so as to be not at all apparent to the patient, and to be easily overlooked by an inexperienced physician, it will often happen that the retinal changes are perfectly clear and distinct, so that there are hundreds of cases on record in which an ophthalmoscopic examination has led to the first suspicion of renal mischief, and to the examination of the urine by which that suspicion was confirmed. Of late years, moreover, an opinion has gained ground among pathologists that Bright's disease is rather systemic than renal in its essential character, and this view of the matter is much confirmed by the ocular phenomena. We find a certain proportion of cases in which the eye wholly escapes implication in the mischief, in which, from beginning to end, there is neither impairment of sight nor visible change in the retina. We find others in which the retinal changes precede those in the kidney, so that the suspicion of renal mischief, excited by the ophthalmoscope, and not at first verified by the urine, shall be verified at a somewhat later period. Lastly, in the majority of instances, the retina and the kidney suffer simultaneously, and the familiar changes proceed with equal steps in both. It is unnecessary to point out how fully these occurrences confirm the opinion that the primary seat of Bright's disease is not in the kidney, but in the arterial system, and that the renal changes are rendered prominent only because they occur in an organ the functions of which are essential to life. Von Graefe applied to the retinal conditions the word "characteristic," and they were long regarded in this light. A wider experience, however, has shown that they are not characteristic, for although more frequently present in Bright's disease than in any other malady, they are occasionally found associated with other conditions. In fact, the retinal appearances are simply those of degeneration, consisting mainly of fatty deposits and of capillary hæmorrhages; and it can hardly be doubted that the systematic ophthalmoscopic examination of patients, whose age and bodily conditions are such as to render them liable to degenerative changes, would in many cases give the earliest possible warning that such changes were imminent, and in time, as facts were gradually collected, might

afford materials which would render important help in the work of arresting them or of preventing their occurrence. As long as the investigation of the retina is left wholly, or almost wholly, to the ophthalmic specialist, so long must the earlier stages of retinal degeneration, and all the lessons which might be learnt from them, be habitually overlooked. It has been already mentioned that, until these changes were discovered by the ophthalmoscope, the failing vision common in Bright's disease was not only attributed to the effect of poisoned blood upon the nervous organs, but was even constantly cited as a proof that such an effect was actually produced. The discovery of an important structural alteration not only dispelled a cloud of error with regard to this particular malady, but also taught pathologists to look, and in many cases to look successfully, for analogous structural alterations in other conditions of perverted nervous action.

While the diseases of the nervous apparatus of the eye have thus tended to the elucidation of morbid conditions in other parts, I venture to think that a promising field of inquiry is open to those who would investigate the influence of the nervous centres upon the nutrition of the superficial ocular structures. I am becoming more impressed, year after year, by the belief that many of the superficial diseases of the eye, and especially many of the so-called inflammations of the cornea, and some of those of the iris, are really nothing more than neuroses, by which I mean that they are perversions of nutrition produced by central nervous change, and bearing to that change a relation analogous to that which the pain of neuralgia bears to the central conditions which produce it. If this be so—and the opinion rests not only on the natural sequence and mode of occurrence of such morbid phenomena as those of herpes frontalis, but also on the remedial action of such agents as arsenic and bromide of potassium—the diseases of the cornea may at no distant time be made to throw light upon one of the most obscure questions in physiology: the influence of the nerves upon the natural growth and sustentation of the tissues.

If we turn now to considerations more purely surgical in their character, here again we find the peculiarities of the eye rendering assistance in the solution of problems in general pathology. One of our learned societies has lately been engaged in discussing whether cancerous growths should be regarded as of constitutional or of local origin; and the question thus stated is one that justly occupies a large share of professional attention. The eye is the only organ in which we can see cancer, in two of its most malignant forms, as glioma and as spindle-celled sarcoma, from its very commencement; or which permits us to remove the nascent growth with such completeness that we may be quite sure that nothing is left behind, and that any recurrence must necessarily be of new origin, and not a mere sprouting up from the remains of what was there before. My own experience of intra-ocular cancer has strongly impressed me with the belief that the constitutional is secondary to the local affection; for I have now removed several eyes, the subjects of glioma in an early stage of formation, without any recurrence, either in the orbit or elsewhere, after the lapse of a time which would allow a new development of cancer to be looked upon as a second attack of a malady from which the patient had long been free. In one of

these cases, the eye was removed in 1862, and I saw the patient quite well in 1871, or nine years afterwards; while his people then promised me that I should hear immediately if he ever suffered from any serious disease, or from any growth or tumour of any kind. I feel sure that this promise would be kept; and, as I have heard nothing, I conclude that no recurrence has taken place after more than thirteen years.

I shall be called upon, in a future lecture, to speak at some length of the way in which adhesions, left behind by iritis and impeding the mobility of the iris, are apt to excite fresh attacks of the inflammation which originally produced them. To anyone who has watched this process, it is easy to understand why small pleuritic or peritoneal adhesions, results of comparatively slight inflammations of those membranes, should so often, in like manner, be followed by recurrences; and should thus lead to the formation of fresh adhesions, which may ultimately become extensive or even well-nigh universal. But perhaps the most felicitous application of the facts of recurrent iritis to analogous conditions in other regions of the body has been made by Dr. Wharton Hood, in a treatise which you, Sir, have especially commended. Dr. Wharton Hood has used these facts to explain the effects of internal adhesions in maintaining pain and tenderness, and in producing recurrent inflammation, in many of the large articulations; and he has very clearly shown that the remedial effect of the rupture of such adhesions is precisely analogous to the remedial effects of iridectomy or corelysis in the secondary inflammations of the iris. By the details of a morbid process which can be watched from its commencement to its termination, and which can be seen every day at every ophthalmic hospital, he has elucidated one which is concealed from view; and at the same time he has rendered a sufficient reason for the adoption of a plan of treatment which seems hazardous only as long as the conditions which require it are imperfectly understood.

The derangements of motility, which depend upon some interruption of the natural harmony between the nervous and the muscular portions of the motor apparatus, have received from ocular phenomena an almost complete elucidation. In other parts of the body, it is difficult or impossible to arrive at any standard of normal action in these respects, or usefully to compare one side with the other, so that slight perversions of function, even if they are suspected, can hardly be made the subjects of demonstration; and they are often unsuspected until they have attained considerable proportions. In the eyes, however, the associated movements of the pair furnish an exact standard for the measurement of natural function, and the application of this standard is made easy by the double vision which attends upon even the smallest deviation from it, and which varies in its character with every change in the deviation itself. The power of thus discovering the smallest departures from the natural state is necessarily associated with the power of observing the very commencement of the diseased conditions which produce them, of tracing these conditions through all their stages, and of following them to their secondary and to their ultimate results. The dependence of the ocular movements upon three pairs of cranial nerves, which stand in definite anatomical relations to different parts of the encephalon, renders the

exact investigation of ocular paralysis a matter which may often be of the highest importance in the diagnosis of intra-cranial affections; since such paralysis may not only afford the first evidence of cerebral disease, but may also render it possible to form conclusions with regard to the localisation of the central malady. As a single example I may mention the peculiar form of double vision which so often ushers in progressive locomotor ataxy, a form in which the muscular fault is plainly a general defect of co-ordination, and not a paralysis of any single muscle or group of muscles. The double images which are produced are shifting and uncertain, sometimes becoming fused together for a while, and at other times varying their relative positions, and their apparent distance apart, not only from day to day, but even from hour to hour. When such a form of diplopia is presented to a sufficiently skilled observer, it tells its tale with only too much certainty. Besides assisting in the diagnosis of special diseases, the facilities which the ocular muscles afford for investigation have been fruitful of information upon questions of a more general kind. The simple disturbances of antagonistic equilibrium, which formerly often led to an erroneous assumption of nervous disorder, have now been perfectly distinguished from the latter; and the question of the relations of muscle and nerve, which formerly gave occasion to so much discussion, has now for nearly all conditions been perfectly determined. Moreover, the study of the dynamic equilibrium of muscles has taught us that a position of the eyes, which is correct in itself, but is produced or maintained by muscular action which is either excessive or irregularly distributed, not only limits the duration of the visual effort, but also, under some circumstances, produces disturbance of the circulatory and nutritive functions within the eyes—disturbance which may even extend to distant organs, and may simulate disease of a very serious or alarming character. The speedy fatigue experienced by some short-sighted eyes, and the rapid increase of their myopia, are familiar instances of the former kind, and it is often possible, by tenotomy or other operative proceedings, or even by the aid of optical appliances alone, to place the muscles under more favorable conditions of action, and thus to diminish or remove the previously existing evils. As an example of the occasional extension of the effects of perverted action of the ocular muscles, I may briefly refer to the case of a young gentleman who was withdrawn from an university, was sent on a voyage to Australia, and was finally sentenced to abandon all his prospects of usefulness or happiness in life, on account of vertigo and other symptoms, which were erroneously attributed to some obscure disease of his brain, but which were due to no more serious cause than over-fatigue of the internal recti muscles of his eyes. This young gentleman, whose case is described at length in the eighth volume of the Clinical Society's Transactions, was instantly cured by a pair of spectacles; and cases like his, in kind if not in degree, are by no means of infrequent occurrence. That unnecessary muscular effort, acting upon organs from without, will produce injurious effects upon them, has been at all times recognised with regard to the thoracic and abdominal viscera, but only in an obscure and doubtful manner. It has been reserved for those who have studied the muscular mechanism of the eye to express the principle clearly, and thus

to solve a question of high importance in prophylactic medicine. In surgery also, the long debate whether the action of tenotomy was mechanical or dynamic has been settled in the former sense, and a sufficient reason has been given why a change in the conditions of resistance gave rise to erroneous impressions concerning the innervation.

Upon such grounds as these, Mr. President—grounds the illustrations of which might be indefinitely multiplied,—I would, to the utmost of my power, urge upon all whom my feeble voice can reach, and especially upon all who are in any way the leaders of professional opinion, that they can scarcely do better work, or work more calculated to advance the best interests of our calling, than by assisting to rescue ophthalmology from what one of my predecessors in this chair has aptly called “the curse of specialism.” Precisely as we have, and probably always shall have, in this and other great centres of population, men who devote themselves entirely to the treatment of the diseases peculiar to women, so, I apprehend, shall we always have men who devote themselves entirely to the treatment of the diseases of the eye. To such an arrangement I do not, as I could not consistently, demur, and I have already endeavored to set forth for what reasons, and in what directions, some limited form of specialism seems to me to be advantageous. But just as, notwithstanding the gynaecological specialists, the diseases peculiar to women are regarded by almost every practitioner as constituting a subject-matter to which he is bound to direct his attention, so I would have every practitioner regard the main facts and outlines of ophthalmology. I crave for a recognition of the truth, as I take it to be, that the diseases of the eye open the shortest road to the mastery of the principles of general pathology, and that they present in simple and accessible forms the very alphabet of medicine and surgery. In order that they may be so regarded, those who are called upon to teach them are in urgent need of the active co-operation of examining boards and of licensing authorities. Since the time to which I referred at the commencement of this lecture, the facilities for acquiring knowledge have been multiplied a hundredfold, but the necessity for the diligent use of those facilities has not been brought home to the minds of students with anything like a corresponding degree of force. Teachers can, indeed, take students to the water, but it is only examiners who can make them drink. The Council of this College, acting in concert with the authorities of the College of Physicians and of the University of London, might do more to promote the study of ophthalmology in a single year than we the teachers could effect without them in a century.

And I think, Sir, that it would not be among the least benefits of such a course, that the practitioners who confine themselves to ophthalmic matters would come at no distant time to the enjoyment of the great privilege of working before critical and appreciative audiences. This privilege we cannot now be said to possess; and we are compelled to recognise the existence of a state of things in which a variety of short cuts to fame may be almost as efficacious with the profession as with the uninstructed public. The boys of a great school were lately engaged in expatiating on the demerits of their respective fathers. At last one boy, whose ardor of denunciation had somewhat slackened, said:—“Most of this is quite true, but,

after all, I think we ought to remember that they are our fellow-creatures.” The speaker was immediately silenced by manifestations of disapproval, but his words struck home. I ask no more of the heads of the profession than that they will recognise us poor specialists as their fellow-creatures, and that they will assist us to preserve the foundations of our craft in the great principles not only of medical science, but also of medical conduct. If this assistance is not afforded, we may chance to see the treatment of eye disease, at no distant day, become a still more distinct department of practice than it is at present; with the necessary result that ophthalmology, cut off from its proper root in general medicine, would soon languish and decay, and that general medicine would lose all those aids to its progress which ophthalmology is so well calculated to afford. The scientific decadence of ophthalmology would probably be attended by a still greater evil, in that those who followed it would be tempted to supply the imperfections of their knowledge by the arts of quackery. When our so-called oculists were few in number, they suffered the original ophthalmoscope to be strangled in its birth; and, now that they are more numerous, their best safeguard against any similar neglect of future opportunities would be furnished by an intelligent professional observation of the nature and of the results of their labors.

In thus urging the claims of ophthalmic science to a greater degree of recognition than it has hitherto received, I shall certainly be met by the objection that the area of medical education is already sufficiently extensive, and that students have quite enough to learn as it is. I would reply by pointing out the difference between the study of principles and the study of details, and by saying that a knowledge of the principles of ophthalmology will assist in the attainment of a knowledge of medicine and surgery, just as a knowledge of the principles of universal grammar will assist in the attainment of any single language. I am not so unreasonable as to ask for the devotion to the subject of an amount of time in excess of its actual importance in the affairs of life, or for the acquirement, by practitioners generally, of the minutiae which I have already mentioned as falling legitimately within the province of the specialist. But I venture to think that our present scheme of medical education includes some subjects which might properly be acquired at an earlier period, and others which without serious loss might be abandoned. Botany, for instance, is chiefly valuable, medically speaking, to the pharmacologist; and pharmacy is rapidly ceasing to be, or to be regarded as, a part of medical practice, on which it was only implanted, as a sort of parasite, by the circumstances which threw the education of a large proportion of the profession into the hands of the Society of Apothecaries. There are also other subjects, which it is not necessary now to particularise, but which have comparatively little bearing either upon the requirements of the sick, or upon the duties of the surgeon, and which might not improperly give way, at least in some degree, to one that is so important to both.

And now, Mr. President, it only remains for me to express my grateful consciousness of the attention with which I have been heard. I have sought, I fear at the cost of much tediousness, to assert the claims of ophthalmic surgery against



what seems to me to be an unmerited degree of neglect; and on the next occasion I shall have to ask the attention of my hearers to a subject of a more immediately practical kind—to the varieties and the clinical history of glaucoma.

## Clinical Lecture

ON

### MORPHŒA ("ADDISON'S KELOID").

*Delivered at University College Hospital,*

By TILBURY FOX, M.D., F.R.C.P.,

Physician to the Department of Skin Diseases at the Hospital.

GENTLEMEN,—The disease to which I wish to direct your attention to-day, and which receives a remarkable illustration, in a most exaggerated form, in the case of the girl, E. J—, in Ward 8, is Morphœa. It is the same as that described by Dr. Addison as keloid, and known, at Guy's Hospital particularly, at the present day as "Addison's keloid"—an unfortunate designation, because the disease has no relation to keloid. Some writers—for example, Neumann—describe the whitish anæsthetic patches which occur in the anæsthetic form of leprosy under the term morphœa; but the disease to which I now refer is wholly different: it is an independent malady, quite distinct from leprosy.

I will, in the first instance, give you a brief sketch of the features of a typical case of morphœa. The disease occurs in patches, almost always circular in form. These patches are only slightly elevated, and have a white, waxy, polished look, a very firm feel, and a dull reddish-colored margin, or lilac circle of minute vessels. The centre of the patch is less sensitive than the healthy skin; it may be nearly anæsthetic. The disease is due to a deposit of fibroid material in the true skin, which often obliterates the vessels, hairs, glands, and nerves. There may be one or more patches, and these patches may vary much in size. The first appearance is a small, white, indurated *plaque*, edged round with a ring of vessels. The disease tends to spontaneous cure in many cases, and then the white centre gradually resumes its color, its softness, its vascularity, and its sensibility. In some severe cases, however, the deposit has interfered so much with nutrition that the normal textures are left shrunken and atrophied. The patches occur chiefly about the back of the neck, the upper part of the chest, the breast, the abdomen, the thigh, the arm, and the face. In the atrophic form deformity results, as in the face. It is usually unilateral, but may be, rarely, symmetrical, as in the present case. It occurs in delicate females; and, lastly, it is often the early stage of scleroderma, or is found in conjunction therewith. The disease is a fibroid degeneration of the skin.

Now, let us compare the notes of our case, for which we are indebted to Mr. Garlick, with the above description, and then proceed to point out

the peculiarities of the disease in our patient; and, finally, speak of prognosis and treatment.

E. J—, aged nineteen, has been a domestic servant for four years. She has always been well fed and clothed, and usually lived in dry and healthy parts. Her father died a month ago of a paralytic stroke; previously he was a healthy man. Her mother is still alive; she suffers a great deal from rheumatism in the head and face, but is otherwise healthy. The patient has a brother and a sister alive; the former is weak, but neither has any scrofulous history. She has had one brother die, she states, after amputation of the leg for white swelling of the knee, the result of a slight injury. There is no history of phthisis in any member of the family. She herself has always been healthy. She says that the skin affection commenced in October, 1872; she was quite well at the time. She first noticed a white spot on the right side of the neck, about as large as a sixpence; it was not painful, but it was shining, and had, in fact, all the characters that it now presents. It spread quickly from its starting-point, which was about an inch below the lobe of the right ear, round the neck under the chin to a similar point on the left side; and as it extended she experienced a difficulty in bending the neck down, from a feeling of tightness in the skin, but could easily turn it to one side. Two patches then formed on the chest, one above each breast; they began as white pimples, soon spreading and becoming larger, but she cannot give a distinct idea of their rate of growth. About the same time she noticed spots on the arms at the bend of the elbow, and as they spread she found some difficulty in extending the arms (chiefly on the right side); the movement of extension soon also became very limited. Not very long after she noticed a large patch on the left thigh, which soon spread over nearly the whole of the thigh in front; the movements of the hip-joint were unimpaired. Soon after the right thigh became the seat of the disease, a patch commencing in front near the top, and spreading from that all round the thigh. Since the patient has kept her bed it has spread down both legs. The breaking out she describes as coming like long cracks in the white mass, as if cut, and a disagreeable-smelling discharge of watery fluid comes away, the bottom of the fissures looking green, and the whole being very painful. The white masses partly come away, and leave a shining, red, hard, glazed cicatrix.

*Present state* (Jan. 30th).—Patient complains of pain in both knees, of a shooting character, and much increased by contact with the clothes. Says she has a feeling of tightness in the chest on taking a deep breath, and has become short of breath; she has noticed this since the spots came on the chest. She has a widely distributed alteration in the skin, very symmetrical on the two sides, and apparently of two kinds, which, however, graduate into one another at parts—viz., white, hard, elevated patches, and red, hard, inelastic, and thickened, but not elevated skin,—affecting mainly the limbs and neck. The white patches vary in size from a line in diameter on the right instep to widespread masses, as those on the thigh. They are of a dead-white color, opaque-looking, as if a white mass were under the cuticle and elevating it; no hairs are seen in them, but the follicles are dilated and plugged with brownish matter inside.

No sweat-glands are to be seen. The whole mass is sometimes slightly elevated; the margins are usually well defined, in some parts being of a purple color, in others passing into the firm red skin, and at other parts abruptly into the healthy skin. Some patches present bright-green subcuticular points, whilst others are more or less red in the centre. To the touch the masses are firm and cannot be pinched up; when touched lightly in the centre patient cannot feel it, but soon finds out if pressed a little harder. Some of the patches are ulcerating and discharging a yellowish clear fluid; others, which she says have ulcerated, have left the skin shining, red, and hard. The character of the other form of diseased skin consists in redness and induration, and contraction so as to flex the joints. The surface is neither elevated nor shining.

*Distribution.*—A mass on the right side of the neck, commencing above on a level with the lobe of the ear, and extending to the outer part of the cheek, passing down the outer part of the face and neck, and coming to a point under the chin about the middle line. A similar shaped mass on the opposite side has the same distribution, and comes to a point under the chin a little way from the middle line. The upper angle on both sides in the bend of the neck is thickly crusted and dry. A patch exists on and above each breast, of the same shape on both sides, measuring about three inches transversely and two from above downwards. Both of these patches have a lilac-colored border at their inner and lower parts; they are not so hard as most of the patches, and are redder in the centre. Another commences on the right shoulder at the root of the neck, and passing down the outer side of the arm, at the level of about an inch and a half below the anterior fold of the axilla, stretches round the arm, losing the white and shining character, and passing into the other form, which envelops the arm except at the inner side near the elbow, where the skin is healthy. The surface of the front of the arm near the elbow-joint is tight, not corrugated, and the joint is kept at rest at a right angle, extension being impossible, and flexion only practicable through a few degrees, the pain being referred to the skin above the elbow. The skin of the forearm is hardened and red, whitish below; and there is a patch on the back of the hand. Extension is pretty free at the wrist, but flexion almost wanting, the joint being held straight. The skin is ulcerated at three points—viz., the middle of bend of elbow in front, the inner side of arm, and over the centre of the radius on the outer side. The skin of nearly all the left arm is similarly affected, the white, waxy character being marked above, and reaching higher towards the neck than on the right side. The skin on the outer side of the arm and behind above the elbows is healthy. Movement at the elbow-joint is much easier than on the right side, the forearm moving from about an angle of 170 degrees to one of 40 degrees with the arm. The left wrist can be bent to about half a right angle from the straight position, and extension is free. The skin of the left forearm is not so much implicated as that of the right. Patches are present on the outer part of both buttocks, affecting the whole of the skin there; passing down around both thighs, implicating the whole skin, and ulcerating on the inner side; running down both legs, in the right one nearly to the ankle, with a few patches on the instep. Large

patches also pass down the left leg, the healthy part being chiefly behind and below; a patch also on the instep. Both knee-joints are flexed at a right angle, and movement is very limited. Flexion and extension are free in the ankles.

Feb. 11th.—Patient sleeps and eats well; bowels habitually confined. Says she suffers no pain except when she is being dressed. The sores have been healing since she has been in the hospital. About a week ago one broke out opposite the flexure of the left elbow. On the left leg, on the inner side, opposite the junction of the upper and middle thirds, is an oval patch about two inches by an inch and a half. This patch is elevated, white with the cuticle desquamating, gives an obscure sensation of fluctuation, and is very tender to the touch, but is not spontaneously painful. She says she expects that it will form a sore.—12th: Bowels were opened yesterday by an ounce of saline aperient. She feels well in her general health. The patch of the disease described yesterday is more elevated, and has been giving her pain, which shoots up her leg to the other sore places; there is also a slight throbbing sensation in it. When gentle pressure is exercised over the patch a thin, nearly transparent liquid issues from beneath the patch at its lower end.—14th: Patient had not quite so good a night, in consequence of shooting pain in the sore above the right elbow; and the itching of the legs was so great that she could have scratched them if the bandages had been off. A poultice was applied to the patch of the disease described above.—16th: The poultice was renewed only twice. The patch above mentioned has become sodden, and when the thicker superficial layer of epidermis is raised a surface which is dead-white, resembling lard in appearance, can be seen; this substance, however, is not greasy to the feel, but is friable. The pain in the sore above her elbow was very bad yesterday. Poultices to be changed every four hours.—17th: She has slept well, and has been free from pain. Bowels not open yesterday; tongue clean. There is no change since yesterday in the patch on the left leg; she says the poultices relieve the pain in it. The sores on the legs and arms are diminishing in size. Urine acid; sp. gr. 1016; no albumen; no sugar. The addition of a solution of iodine to some of the crust from the patch on the left leg turned it of a dark-brown color, much darker than that of the solution. The same change was observed in the epidermis scales under the microscope.—19th: The only time she suffers pain in the patch on the leg is when the poultice is first applied. To-day she has more pain in the sore above the right elbow.—20th: Last night she perspired very profusely and was very thirsty. She is thirsty to-day, and says her head has been aching. 2.30 p.m.: Pulse 100; temperature 99°. She has not taken her dinner so well to-day, and says she could not take her oil, because it made her feel sick. She does not look so well. There is a small ulcer at the lower end of the patch on the left leg, the floor of which has a pale green color. The patch is very tender to the touch. She does not complain of pain in any of the other sores.—21st: She is better; has had a good night, but complains of pain in the sore above the right elbow. A portion of the crust or slough of epidermis was taken from the patch on the left leg and placed in a solution of iodine, containing four grains of iodine and eight grains of iodide of potassium to one ounce

of water; the color which the tissue then presented was decidedly darker than that of the surrounding liquid.—23rd: She complains of having a cold in her head, but is better in other respects; takes her food better, and does not complain of any particular pain. The sore and the patch on the left leg are still very tender to the touch; the ulcer is a little larger, and its floor is still of a greenish tint.—24th: Her cold is better. The sores generally are improving. The ulcer in the patch on the left leg is about the size of a sixpence; it was dressed this afternoon with litharge ointment, and a poultice applied over it and the patch. Dr. Fox thinks that the patch of morphea on the back of the right hand is thinner. She is taking confection of senna (one drachm) every morning, which, she says, gives her great pain until it has operated.—25th: Her general health is good. She says she is sure the white patch on the back of each hand is redder and thinner than it was; the patches on the breasts, she says, are also thinner and redder than they were; this is especially the case in the centre of the patch.—26th: The sores on the left arm are nearly well. On the right arm the sore above the wrist is very painful, and is covered in some places with a black slough. The sores on the legs are much improved. A small blister on the front of the left knee, which was noticed to be there on Feb. 11th, was pricked to-day; a thin, clear fluid exuding, which was neutral in its behavior with blue litmus and turmeric paper. This blister was painful when pressed. Poultice stopped.—27th: She does not complain of anything. On wiping the discharge away from the ulcer in the patch on the right leg, granulations can be seen over its floor; the ulcer is slightly larger, and is very tender to the touch, as is also the skin about it.—She soon went to Eastbourne for change of air.

I do not think it necessary to trouble you with further details.

Now, as to the antecedents in this case, you will note that there was no distinct state of ill-health in the girl. Her present appearance indicates that she is a weakly and semi-strumous subject. All that you can generally say of patients who get morphea is that they are "out of health," in the way of general debility. This girl was even well fed. No assignable exciting cause, then, can be given for her malady. Next as to the history of the disease. It began, as morphea usually does, by a painless, whitish, and indurated spot, which gradually augmented in size. But in her case the disease is much more extensive than I have seen it before. It is very typical in the patches about the chest, just above the breast on either side, and the backs of the hands; in the opaque whiteness, the induration, the diminished sensibility, and the edging round of the patch by a vascular ring of dullish hue. But in other parts the circular patch character of the disease is not seen; the disease has become diffused, as it were, over large tracts of surface, and the skin is so deeply and extensively altered that considerable deformity is produced, with limitation of the movement of the subjacent joints in consequence. It is this state of things that reminds one of the condition known as scleroderma, and in fact the disease has passed, as it were, into scleroderma, only that the elevation of the parts is not so distinct as usual, and the color is not so yellowish-white or dark as in scleroderma. But in that disease you not infrequently notice that the central main tract of disease is raised, in-

durated, brawny, and dirty yellow-white, whilst the edges are white and alabaster-like, as in morphea, a state of things that discloses the real relationship which exists between the two conditions.

The disease in this girl, unlike morphea as the rule, is symmetrical. Another point in which it differs from typical cases of morphea is in the ulceration of several of the patches. But this is to be readily explained by the profound alteration of the skin, and the consequent disruption of the natural structures. You will observe also in this case the ordinary process of cure which nature provides in morphea. If you have examined carefully from time to time the patches about the breast since the girl's admission to hospital, you will not have failed to notice that whereas at the outset the central portions were white and markedly indurated, they are now losing this aspect and feel. They are softer, less thickened, and fine vessels are now seen to be coming into view from below, as it would seem; in fact, the infiltrated material is being gradually absorbed, and no doubt, as in less severe cases, the skin will gradually recover its natural condition, but only after a long time. In other parts of the body in our patient, as in severe cases of morphea, the infiltration is so complete and excessive as to destroy the normal textures, or to disorganise them beyond the possibility of repair, and therefore permanent atrophy, cicatrization, and deformity result on removal of the infiltrating material.

In our case, unquestionably, a certain amount of deformity will result about the elbow and knee-joints, though with care the present degree of deformity will be much reduced.

Now, gentlemen, in private practice you will occasionally meet with cases of morphea. Once recognise its general character, and you will not be likely to err in diagnosis if you recollect that it usually occurs in the form of one or more small patches about the face, the breast, or the abdomen or limbs. The affected point out to you a little whitish place, that may be mistaken for leucoderma; but, unlike leucoderma, in many places there is a distinct textural alteration of the whole skin, and the lilac ring of vessels is mostly very distinct. And you may tell your patient that with care the disease, if moderate in degree, will vanish under appropriate treatment. But where the morphea becomes diffuse, as it were, you must anticipate for your patient a certain degree of atrophy and deformity, especially if the seat of disease is about the eye.

And lastly as to treatment. The patient was thin, anæmic, greatly debilitated and depressed on admission. We have done nothing locally for the morphea, but have fed her up well and administered cod-liver oil, quinine, steel, and the like, and she is gaining strength, color, and flesh, with a corresponding diminution of her disease.

Whenever you meet with cases of morphea in practice, your duty is to adopt a similar line of treatment, and, above all things, never to apply irritants to the part affected, but to protect it from irritation of every kind. The skin is the seat of defective nutrition, and this must be remedied by influencing it through the general health, and not by the use of any local remedies except such as soothe and protect the part.

[The patient subsequently went to Eastbourne, and returned greatly improved, with the wounds

healed, and in a condition which enabled her to walk comfortably and to do some little work, the improvement still continuing.]

## Clinical Lectures

ON

### OSTEO-MYELITIS AND ACUTE PERIOSTITIS.

By C. MACNAMARA, F.C.U.,

Surgeon to the Westminster Hospital.

#### LECTURE II.

BEFORE discussing the pathology of osteomyelitis, I wish to draw your attention to some specimens of healthy bone. The extremities of the long bones are surrounded by a thin layer of compact osseous tissue, but the bulk of the spongy portion of these bones is constructed of a number of osseous trabeculae, and the spaces between these processes are, in the living bone, filled up with soft structures (medulla), which play the most important part in the various forms of disease we shall have to consider. With the aid of preparations made by soaking sections of injected bones in solutions of chloride of gold and glycerine, I shall be able to explain to you the anatomy of the soft material filling the spaces in the spongy portions of the long bones. And let me here remark that these soft tissues are continuous with those occupying the medullary canal, and they also abut on the attached surface of the articular cartilages, actually filling more space in the spongy portion of bones than the osseous trabeculae. The greater number of the vessels which pass into the extremities of the long bones are derived from vessels perforating the periosteum and outer thin layer of bone, and not from the nutrient artery. For instance, the vessels of the lower end of this femur have been injected from the popliteal artery, and this anatomical arrangement of the vessels will in some measure explain the fact, that in certain cases well-applied and continuous pressure round the lower end of the femur may influence inflammatory changes going on in the bone, the blood-supply to its spongy tissue being thus materially affected—in fact, a layer of extract of belladonna and mercurial ointment smeared thickly over the skin covering the condyles of the femur and knee-joint, the whole being encased in well-applied strapping, would place the inflamed intra-osseous structures in much the same condition with reference to their supply of blood, as the iris would be in after the pupil had been fully dilated with atropine for the cure of iritis; the supply of blood to the bone would be restricted, and the part kept at rest—two important elements in the successful treatment of inflammation.

If we examine the soft structure in the cancellated tissue, we shall discover that it is fairly supplied with blood, many of the smaller vessels coursing along the walls of the trabeculae, while others stretch across the intra-trabecular spaces. In addition to these vessels, the spaces contain a

network of fine adenoid or connective tissue, its meshes being filled in with fatty material and a vast number of granular cells, which, as a rule, seem to adhere to or grow from the connective-tissue fibres. This latter structure is not only spread throughout the spaces in the spongy portions of the long bones, but it also lines the osseous trabeculae, and is continuous with processes of connective tissue passing through the outer lamina of bone from the periosteum. Many authorities hold that this plexus of adenoid tissue is to be considered as the commencement of the lymphatic tissue in bones. It seems to me that in the medullary canal the evidence in favor of this view is very strong, and I think we may yet demonstrate the existence of lymphatic structures in this situation. But however this may be, we certainly find that the Haversian canals contain a network of adenoid tissue in addition to their vessels, and that this connective tissue, together with its cells, plays an important part in inflammatory and other abnormal processes going on in the interior of the long bones. It is almost unnecessary for me to remark that a considerable number of our patients suffering from disease of the bone are young persons, and in these cases we shall find, in addition to the elements I have already described as occurring in the cancellated tissues, a number of giant cells (myeloid), such as we always meet with in the medullary spaces before the adult period of life.

If we examine these sections of the articular surface of the tibia which have been rendered transparent by glycerine, we shall be able to comprehend the anatomy of the cancellated structures immediately beneath the articular cartilages. The soft material filling these spaces projects down to within a very short distance of the attached surface of the cartilage, the medulla terminating in bulb-like masses, from which processes run along passages in the bone up to the cartilage. So numerous are these channels passing from the medullary spaces to the cartilage that the layer of compact bone they perforate may be said to be riddled with tortuous channels, and this layer would therefore be a weak point in the bone were it not for a peculiar arrangement of its calcareous elements. With a half-inch magnifying power we can see small lumps and a quantity of granular earthy matter dispersed in an abundant but irregular manner in the osseous lamina between the cartilage and the cancellated structure, and the canals I have described pass up towards the cartilage through this calcareous layer, which, from its peculiar construction, is apt to resist inflammatory or other abnormal action going on in the part; at the same time changes occurring in the medullary substance can pass along the contents of the canals to the attached surface of the cartilage.

We may now proceed to examine the alterations which have taken place in a portion of bone affected by inflammation, and we can hardly have a better illustration of what occurs under these circumstances, than that afforded us by sections made through the inflamed spot in the lower surface of the astragalus, which I showed you in the last lecture in the case of W. S.—, reported very accurately for me by my dresser, Mr. Trewman. As a consequence of the increased action going on in this inflamed patch of bone, which is in immediate proximity to the cartilage, we find that rapid proliferation has taken place in the nuclei of the

neighboring cartilage cells, each nucleus dividing into four, six, or eight parts; but, in addition to this, you may notice that a great number of the original cartilage cells appear to be, as it were, in a pit, as seen by transmitted light. This appearance is due to an increase in the contents of the cavity, within which the cartilage-cells lie; and, on examining this specimen with a high magnifying power, we shall discover that the abnormal contents of these cartilage cavities are due to a granular material (protoplasm) which we can clearly trace from one or more of the canals leading from the medullary spaces down to the cartilage. This medullary matter, having rapidly grown in consequence of the hyperaction going on in the bone, has infiltrated the cartilage, and, passing into the cavities of its cells, has there continued to grow; so that many of these cartilage cavities have become large irregular spaces, and, these uniting with one another, a hole has been formed in the cartilage, which, had it increased in size, would have opened on the free surface of the cartilage, and thus formed what we commonly designate an ulcer. In this specimen, therefore, we have clear evidence as to the fact that osteitis (or, as I prefer to call it, osteo-mylitis) may lead to the ulceration of the articular cartilages, and that, the cartilage having been perforated in this way, a sinus passes through it leading into the medullary spaces in the spongy portion of the affected bone, from which the protoplasm which has caused all the mischief has in the first instance advanced.

With reference to the bone, the most obvious pathological alteration we notice in the specimen now under our observation, as the result of the inflammatory process, is that its vessels are engorged with blood, and that the parts surrounding them are stained by the coloring matter of the red corpuscles; it is not simply serum and white globules that have passed from the vessels into the neighboring tissues, but that there has been a disintegration of red corpuscles, and their contents have percolated the inflamed area. Beyond this we observe that the fatty matter contained in the medullary spaces is diminished in quantity, and that the giant cells are greatly increased in number, almost entirely occupying the whole of many of the medullary spaces; and doubtless, unless the inflammatory process were excessive in its action, it is from these cells that new bone would have been produced, the layer of newly-formed osseous tissue acting as a protective influence against the absorption of the products of inflammation into the system, in the same way as the walls of an abscess preserve the circulating fluid from the passage of pus into the blood. We shall subsequently see how beautifully this action on the part of the cells has worked in the case of chronic osteo-mylitis I referred to in my last lecture, but in the instance now under consideration, the disease being acute, the myeloid cells have exceedingly multiplied in consequence of the over-action going on in the part. But they have not had fair play; surrounding circumstances have choked their growth, and here we see them crowding and pressing on one another, striving, as it were, to escape from their confinement in the medullary spaces. With a light brush we may sweep away these giant cells, and then we shall notice more clearly that the cells of adenoid tissue in the cancellated structure are infinitely more numerous than in health. The

giant cells, in fact, lie imbedded in a fibrous material which is crowded with granular cells; these may be derived from the blood, but I am disposed to believe they are the offspring of the original cells I described to you as existing in the connective-tissue fibres in this locality; and we have evidence in cases of necrosis that these cells may either degenerate into pus, or they may become developed into granulation-tissue. In addition to these cells the medullary spaces contain a large quantity of granular protoplasm, some of which, as we have already observed, has passed into the neighboring cartilage, and much of it has evidently been absorbed through the canaliculi, and so entered the lacunæ of the surrounding osseous trabeculae I am aware that it is a disputed point as to the part which the bone-cells of the lacunæ take in the process of osteitis, and it is not my province to pass an opinion on the conflicting views held on this subject, but simply to help you to interpret the pathological changes that have occurred in the specimens now under our consideration. From these you will see that many of the canaliculi leading from the inflamed medullary spaces to the lacunæ are evidently enlarged, and most of the lacunæ are even four times their natural size, being filled up with granular matter; in fact, they are in much the same condition as the cartilage-cells, having been invaded by a quantity of rapidly-growing protoplasm from the medulla. The normal function of the living matter (nucleus) contained in the bone-corpuscle is impaired, and you must bear in mind the fact that the osseous structure immediately round one of these corpuscles is, as Dr. Beale says, formed material, being in health repaired and kept in its normal state through the action of the living protoplasm in the bone-cell. Destroy this nucleus, and, the nutrition of the surrounding area of hard bone, depending on it, being no longer accomplished, a cavity is formed round the bone-corpuscle, which in the case we are now considering is occupied by the growing protoplasm from the medullary spaces. Under the influence of the inflammatory process one lacuna after another becomes destroyed, the spaces they occupied run into one another, and a cavity occurs in the trabecula, which ultimately opens directly into the nearest medullary space. The form this cavity takes is that of the original growth of the lacuna system, being thus more or less circular in figure. It is evident, therefore, that the osseous framework of bone plays but a very small part in cases of osteo-mylitis, and, in fact, we may have almost the whole of the soft structures contained in one of the long bones absolutely destroyed and the patient killed from the effects of septic poisoning; and yet we might examine sections of the dry bone under the microscope, and be unable to discover that the Haversian system had been in any way implicated, illustrating the point I have so often dwelt upon, that the study of pathology is apt to mislead us unless we examine specimens of the structure implicated immediately after death, and alter their condition as little as possible by chemical reagents. It may be that the original cartilage and bone-cells take a more active or even a suicidal part in the disintegration of structures depending upon them, but we fail to see any indication of this process in the specimens now before us. You are aware that many authorities believe the disintegration of the bone in cases of this kind is due to the formation

or secretion of an acid fluid in the inflamed structures, which is supposed to dissolve out the earthy particles from the bone, destroying it by means of chemical action. I can only say that my observations have failed to convince me that any such acid is formed. If such were the case, surely the matter would have been set at rest by chemists long ago. Nor do we require the help of a theory of this kind to explain the phenomena I have described, for if the nucleus or living portion of the cell is destroyed, evidently, the parts around which depend upon it being no longer repaired, a cavity must result in the osseous structure, such as I have above noticed. In ordinary language, if the source from which a stream has been fed becomes dried up, we hardly talk about the river having become absorbed; and so in the matter of the cartilage and bone-cells, if the living material from which the parts are produced ceases to be, evidently an empty space occurs around the site of the original protoplasm, which cavity, as in the instance now under consideration, may speedily be filled up by extraneous matter.

As the inflammatory process advances in the medullary cavities of bone, pus and the disintegrated surrounding materials become mixed together in a decomposing mass. Septic matter of this kind, although no external air is admitted into it, is a deadly poison if introduced into the circulation; for, as I told you the other day, I have seen death resulting from a large plug formed in the right side of the heart, and extending into the pulmonary artery; from the absorption of matter of this description from an injured spot in the diploe of the skull. This tendency to septic poisoning is enhanced when air gains access to the products of the inflamed bone, as is usually the case in osteomyelitis, and in acute cases there is no chance of a limiting membrane being formed round the inflamed part, and hence the blood-poisoning that so frequently occurs in this form of disease. It is not very uncommon subsequent to amputation for our patient to die suddenly some eight or ten days after the operation, and if we seek for the cause of death, we may find in the right side of the heart a firm clot of fibrine which has killed the patient; and if we examine fresh sections of the bone cut through during the operation, we may often discover in such cases that the contents of the medullary canal is already largely made up of putrid material, which, having been absorbed into the blood, has destroyed the patient as above described.

In acute periostitis the condition of the inflamed parts is very different from that found in osteomyelitis, as the section of the fibula referred to in my last lecture demonstrates. In this instance, although suppuration has occurred between the bone and the periosteum, and the shaft of the fibula been thus laid bare, still the soft structures outside the periosteum have also been inflamed; in fact, an abscess has formed round the bone, and the inflamed area is thus limited by consolidated tissues, through which the absorption of the products of the inflamed tissues into the system is greatly hindered. It is true so grave a lesion to the periosteum as that above alluded to must affect the nutrition of the bone, but, unless the contents of the medullary canal participate in the inflammatory action, the patient's life is not likely to be endangered from pyæmia. In the case before us the contents of the medullary canal and Haversian

system surrounding it seem to be perfectly healthy, their vascular supply being derived from the nutrient artery of the bone; but in the outer layers of the fibula, which have grown from and been nourished by vessels from the periosteum, we find that a number of cavities have been formed through the breaking down of lacunæ in the manner I have described, and the layers of bone surrounding the shaft of the fibula were becoming necrosed in this way. It is easy, however, to imagine that in acute periostitis the inflammatory action might be propagated along the connective tissue surrounding the nutrient artery or the vessels passing into the cancellated tissue, and set up a similar action in the medullary structure, which in its turn would very probably induce pyæmia; but then the disease is no longer one of periostitis, but of osteomyelitis.

From a practical point of view we may conclude that in acute periostitis, although the fever runs high and the parts affected are intensely inflamed, still we may fairly hope, by very free incisions down to the bone, to arrest the danger of septic poisoning; and if the disease has occurred to parts below the knee- or elbow-joint we may save the limb. The case is much more serious if the humerus or femur is attacked by acute and rapidly spreading periostitis; for the surrounding tissues become extensively implicated, the vessels may be eaten into, and the loss of blood and profuse drain of matter from the part render amputation at the shoulder- or hip-joint necessary, and I need hardly add that these are operations from which we justly shrink under the circumstances. If, on the other hand, during an attack of this kind, pyæmia supervenes, we may be almost certain that the medullary tissues are implicated; and, in my opinion, wherever the seat of the disease may be, the sooner the part is removed at or above the joint beyond the disease the greater will be the chances of the patient's recovery; every day, I may say, almost every hour, you delay this proceeding renders the prognosis more unfavorable.

## Clinical Lectures

ON

### LISTER'S TREATMENT OF WOUNDS AND ABSCESSSES BY THE ANTISEPTIC METHOD.

By THOMAS SMITH, F.R.C.S.,

Surgeon to St. Bartholomew's Hospital

#### LECTURE II.

GENTLEMEN,—In my first lecture I endeavored to explain to you the theory of Mr. Lister's antiseptic treatment, the facts on which that theory is based, and the advantages claimed for the plan by its author. To-day I wish to describe to you how Mr. Lister reduces his theory to practice. But first, I should state more at length the advantages he claims for the antiseptic method in the treatment of abscesses.

Having opened the abscess, he provides a free

escape for the pent-up matter by the use of drainage tubes, and thus he gets rid of the tension which he believes was the cause of the continuance of the suppuration before evacuation. By excluding putrefaction, and thus avoiding a new cause of irritation, which would otherwise come into operation, he leaves the pyogenic membrane free from all abnormal stimulus. As a result of this, he states that suppuration ceases from the moment the original contents of the abscess have been let out, a mere serous oozing being all that subsequently occurs, and that this diminishes more or less rapidly according to the circumstances of the case, lasting longest, as a rule, when carious disease of bone is present. Mr. Lister states that the spontaneous cure of caries under antiseptic treatment is a striking feature of the system, but in order that it may occur he considers it to be essential that the diseased part should be kept absolutely at rest—a condition that is difficult to secure in the treatment of some joints, but can readily be complied with in the case of spinal caries. Lumbar and psoas abscess, which, as you know, generally do badly after evacuation, are, according to Mr. Lister, most hopeful subjects of treatment, provided that unremitting care be exercised to maintain the antiseptic precautions till the sinuses are completely cicatrised.

In carrying out his antiseptic method in the treatment of wounds and abscesses, Mr. Lister's chief aims are: first, to exclude all germs of putrefaction; and, secondly, to provide a free escape for all secretions. Now the first object is attained by cleansing from putrefactive germs the part to be operated on, the instruments and sponges employed, and the hands of those that use the instruments; by creating a germless atmosphere during the necessary exposure of the part; and by disinfecting all discharges coming from the part, lest putrefaction should occur in these, and from these spread to the wound itself.

Mr. Lister has selected carbolic acid as, on the whole, the most convenient antiseptic for his purpose, and this he uses either in the form of *spray*, to protect the part from atmospheric influences during its unavoidable exposure; as a *watery solution*, for washing the surface to be operated upon, for injecting into a wound-cavity to destroy any sources of putrefaction that may have gained entrance, for purifying instruments, sponges, &c.; and in what is termed *antiseptic gauze*—i.e., thin gauze impregnated with a mixture of carbolic acid and resin,—this being employed over the wound or abscess to soak up and disinfect the discharge. In addition to these preparations, thin india-rubber sheeting and oiled-silk protective are made use of in the dressing of wounds. The former, which is merely a thin layer of india-rubber spread upon calico, is used beneath the outermost layer of the gauze to prevent the discharge coming into contact with the atmosphere, and to make it soak well into the gauze. The oiled-silk protective is used beneath the dressings to protect the cicatrising surface from the action of the carbolic acid; it is formed of oiled silk coated with copal varnish and brushed over with a thin layer of dextrine.

A very important part of Mr. Lister's treatment is the provision he makes to secure a free escape from the wound or abscess cavity of all secretions. This he effects by the introduction of india-rubber drainage-tubes of sufficient calibre, and provided

with a sufficient number of lateral perforations to secure a ready escape of all fluids. Mr. Lister has pointed out that under his system it is especially necessary to make this provision, for, when applied to fresh-cut surfaces, the carbolic acid, by its stimulating properties, excites an abundant secretion, which if retained within the wound-cavity would be a serious source of danger; while in the treatment of abscesses the use of the drainage-tubes is insisted on, to avoid tension of the abscess walls by accumulation of pus—tension being, according to Mr. Lister's view, a most potent source of continued suppuration and constitutional irritation.

Perhaps the best way to explain the method of applying the antiseptic treatment to an abscess is to exhibit an actual demonstration of the practice. The large abscess that you see here in the gluteal region is one that has formed in the progress of hip-joint disease, and is without doubt connected with the articular cavity; it is, therefore, suited for our purpose to test the powers of the antiseptic method, especially as the boy has an open abscess in the opposite knee-joint. In this shallow dish, containing a watery solution of carbolic acid (one part to forty) are the instruments required—a knife, director, artery forceps, a large piece of india-rubber drainage-tube attached to a small piece of ligature silk, and a small piece of oiled-silk protective (two or three inches square). Here is the steam spray apparatus made by Mayer and Meltzer, which throws a large cloud of very fine carbolised spray, of the same strength as the lotion (one in forty).\* The skin over the surface of the abscess is first sponged with the watery solution of carbolic acid; and Mr. Vernon having cleansed his fingers with the same solution, the steam spray is turned on, and will be allowed to play on the part during the whole process. The abscess is now opened, and the pus is squeezed out as thoroughly as possible; the drainage-tube is passed deeply into the abscess cavity, and its open end is adjusted so as just to come to the level of the skin. The blood and pus are wiped away with a piece of the gauze soaked in the watery carbolic solution; the small piece of oiled-silk protective is put over the wound, a little hole being cut in its centre so as not to obstruct the open end of the drainage-tube; the ligature-silk attached to the tube is drawn through the hole and laid on the surface, and the whole is covered with the gauze dressing. As the discharge is likely at first to be rather free, from so large an abscess cavity, you will observe that Mr. Vernon places about the wound and around the mouth of the tube a few scraps of loose gauze, to soak up the discharge and prevent it running under the larger sheet of the same material. The larger piece of gauze dressing is about twelve inches square; it is made of sixteen thicknesses folded together, and between the two external layers is inserted a piece of the india-rubber sheeting with the glazed surface downwards; this sheeting should be smaller than the gauze, so as to be well overlapped by it. The whole is secured with a bandage made of carbolised gauze.

In the subsequent management of this case it will be necessary, whenever we may think the gauze is nearly soaked with discharge, and before the discharge has made it way through so as to

\* The bottle attached to the spray-producer contains a solution of carbolic acid, one to twenty; the steam from the boiler, mingling with this, effects the necessary dilution.



come into contact with the external air, to change the dressing. Until we are aware of the amount of discharge this abscess will furnish, it is well to remove the dressing at comparatively short intervals. Mr. Vernon will examine it to-morrow, and, if the amount of discharge is not excessive, will replace the same dressing, or he may remove the small pieces of gauze from around the tube and replace these by others, retaining the large sheet of folded gauze.

The dressings are always carried on under the antiseptic spray with the same precautions that you have witnessed; the drainage-tube is gradually shortened as it is pushed out by the formation of granulations in the abscess cavity, and at each dressing the tube is thoroughly washed in the watery carbolic solution. In changing the dressing, the gauze, when soaked, must be laid aside; but the india-rubber sheeting may be used again and again, provided it is well cleaned by sponging with carbolic solution.

You will have observed that the details and precautions of this plan are somewhat numerous and minute, and you may think them frivolous; but you will allow me to remind you that, granting the germ theory of putrefaction to be true, they are neither unmeaning nor excessive if it be the design of the treatment to prevent putrefaction.

It is of course absolutely necessary that the dressing should be so efficiently secured that it cannot shift its place, and when the opening is situated at the groin, as in psoas abscess, this is far from easy by the ordinary means. I learn, however, from Mr. Lister that he has lately overcome this difficulty by the simple expedient of putting on outside the dressing a bandage of elastic webbing carried once or twice round the pelvis and thigh, so arranged as to press on the edges of the dressing at the most important parts. Experience has shown that this bandage effects its object without causing either oedema of the limb or discomfort to the patient, while it enables the surgeon to leave his patient safely for a week or more at a time without disturbing the dressing when the discharge comes to be of small account.

In cases where the treatment succeeds in its object the discharge gradually decreases in quantity, and the intervals between the dressings become longer as the case proceeds towards cure.

Here is a child with lumbar abscess who has been some weeks under treatment, and we will now remove the dressing, with the usual precautions. You will observe, if you will be good enough to smell the gauze which I remove, that though it has been in contact with the discharge more than a week, it is quite free from any unpleasant odor. In this case it is only necessary to cleanse the skin with a little watery solution of carbolic acid, to cleanse and still further shorten the drainage-tube, to replace it, and to apply a fresh piece of the gauze dressing, which may remain undisturbed for some days.

It may seem scarcely necessary for me to caution you that you must not wait until the smell of putrefaction is perceptible, to change the dressing. But I call your attention to this, as I know that some suppose that they are fulfilling Mr. Lister's directions, who consider that it is time enough to change the gauze when the parts begin to stink.

The dressing should always be at once changed if the discharge has soaked into it sufficiently to appear at the free edge of the gauze at any point

in contact with the external air. As a rule, the change should be made before this is likely to occur, since putrefaction may commence in the discharge in the outermost layers of the gauze, and may thence spread to the deeper parts.

In opening a deep abscess or a joint cavity under the antiseptic spray, if there be a possibility of wounding any vessel that may require a ligature, it is well to cut down deliberately into the cavity, so that if a vessel has to be secured, this can be done before opening the abscess or joint. Of course, all ligatures employed should be of carbolised catgut.

In the antiseptic treatment of operation wounds as distinguished from wounds made for the evacuation of matter, the same precautions are taken as described above. The instruments, sponges, sutures, the surgeon's fingers, the part operated on, are all cleansed with a watery solution of carbolic acid; all the manipulation is conducted under the spray, and all vessels are secured with carbolised catgut.

Great care must be taken to provide a free escape for wound secretions by drainage-tubes, since the stimulating action of the carbolic acid on the freshly cut surface excites a very free secretion, which must on no account be allowed to collect within the wound. Mr. Lister directs special attention to this source of mischief, and advises that the dressing should be, as a rule, changed the day following the operation.

I venture here again to remind you that Mr. Lister does not claim a certainty of success in the antiseptic treatment of operation wounds, unless he has to deal with the unbroken skin. If sinuses already exist, unless they be the sequelæ of abscesses that have been treated antiseptically throughout, it is not possible to destroy with *certainly* the sources of putrefaction that may lurk in their recesses. I do not say that wounds and sinuses long exposed to the air may not be rendered aseptic by the injection of a solution of chloride of zinc, or by the removal of the vascular lining of the sinuses by scraping, but you must remember that there is no certainty of success, and thus it is that the antiseptic method is inapplicable to many cases of resection of the larger joints where sinuses communicating with articular abscesses or carious bone form so frequent a complication.

In my next lecture I propose to give you some of the results of the antiseptic treatment as carried out by Mr. Vernon under my directions.

## Original Papers.

### NOTES ON UTERINE PATHOLOGY.

By GRAILY HEWITT, M.D., F.R.C.P.

#### II.—DESCRIPTION OF THE VARIOUS ABNORMAL CONDITIONS OF THE UTERINE TISSUES.

It appears to be essential, to anything like an accurate estimation of the relation of the various pathological changes in the uterus one to the other, to examine carefully our present nomenclature and

actual knowledge regarding the nature of the tissue-changes in the organ so frequently observed in connexion with distortions and other analogous alterations.

These tissue-changes have been described under various names—chronic inflammation, congestion, hypertrophy, atrophy, areolar hyperplasia (Gaillard Thomas), &c. &c. It need hardly be stated that under these various general designations are included conditions not seldom widely different.

For obvious reasons it will be advisable to limit our inquiries for the moment to the tissue-changes observed in the uterus in the *ante-puerperal* state; for when pregnancy has occurred other peculiar changes result, the consideration of which demands a separate inquiry. Tumours of the uterus are of course excluded.

Medical phrases are of unquestionable utility when they are intended to formulate some known fact or to represent a leading and dominant idea, but when a question is to be seriously debated they are frequently an impediment rather than a help. In attempting, therefore, a clinical description of the tissue-changes in the nulliparous uterus, it will be better as far as possible to avoid them.

The principal physical abnormal changes in the uterine tissues with which we are familiar by clinical observation are—(A) Softness, (B) hardness, (C) enlargement, and (D) diminution in bulk.

(A) *Softness*. By this is to be understood an absence of that degree of firmness and resistance which is natural to the healthy uterus. It is placed first in order because there are reasons, as will be shown, for attaching a high degree of importance to it as a pathological factor. Observation has convinced me that it is a physical change which occurs with great frequency in the early stage of chronic cases of uterine disease. The os and cervix uteri are readily to be felt, and hence this change is one very readily appreciated. The softness presents itself in all degrees. I have found the cervix so soft that its outline was rendered indistinct and closely—so far as its softness is concerned—resembling the state of the tissues of the os in advanced pregnancy. Naturally, as is well known, the vaginal portion of the cervix is very firm and resistant. This softness of the vaginal portion is generally associated with a like degree of softness of the body of the uterus, but in the case of the body of the uterus the change in texture is not so easily appreciable. The evidence of the existence of softness of the body of the uterus conjointly with softness of the os and cervix is of an inferential character, but it is clinically demonstrable. Existing by itself, undue softness of the uterus is not accompanied by exaltation of sensibility under ordinary circumstances. It is almost invariably accompanied by a more profuse secretion than usual from the mucous surfaces of the uterus. It is probably present to a slight degree during the normal process of menstruation, but in such a case the softening is not of course pathological.

Softness of the uterine tissues implies necessarily another quality—viz., pliability. Naturally this is a quality which the uterus possesses in a certain degree, but when the uterus is in a state of health it is compensated by the rigidity which the firmness and resistance of the healthy uterus offers to any attempt to bend it, and which, moreover, aids it in resuming its proper shape after being bent. The uterus is largely dependent, as I have been

for some time accustomed to teach in my lectures, for maintenance in its erect position upon its own tissues, far more, indeed, than upon its outer attachments. Proportionately to the size of the uterine canal the thickness of the uterine walls is considerable, even at the part where the uterus is weakest—namely, at its centre. Deficient firmness in the uterine walls necessarily then implies an increased pliability of the organ, and clinical evidence abundantly shows that exceeding softness of the uterus is very frequently indeed conjoined with an extreme pliability. Not unfrequently the sole discoverable physical change present is this softness combined with undue pliability. There may be no tenderness to the touch, there may be no redness or increased vascularity to be observed by the eye at the os uteri, and there may be no increase in the bulk of the uterus; in fact, it may be even smaller than usual. The cases in which this softness, uncomplicated with other conditions, exists form a very important group, with which I have become acquainted by clinical observation alone, and, so far as I am aware, the bearing of the facts of these cases is a very wide and interesting one in any discussion on the subject of uterine pathology.

The cases in which this peculiar softness of the uterus presents itself in its typical form are those of young women who present other obvious indications of weakness, want of power, debility, and general feebleness. In a subsequent paper it will be shown how frequently such a condition of the uterus is responsible for the inability such patients experience in walking, owing to the circumstance that the uterus is so pliable that the mere assumption of the vertical position suffices to produce a marked degree of flexion, which may be temporary or become subsequently persistent.

My purpose now, however, is to endeavor to arrive at an intelligible explanation of the undue softness.

It is some few years now since Scanzoni published his valuable monograph on "Chronic Metritis." In that work he very forcibly dilates on the circumstance that the so-called chronic inflammatory changes in the uterus would be more correctly looked upon as chronic nutrition disturbances. This view has always strongly commended itself to my mind, and the observations which I have accumulated in the course of some years would seem abundantly to support this conclusion.

Applying these common sense principles to what may be observed in these cases of undue softness of the uterus, it becomes sufficiently evident that these are really cases of imperfect nutrition—starvation—of the uterus. The organ is imperfectly nourished, very frequently in common with other organs of the body; the natural result is that the tissues are soft, spongy, and non-resistant. The cases in which this malnutrition of the body at large gives rise to local malnutrition of the uterus are by no means rare. The age of puberty is one of great growth and development. Much nutritive material is required for the additional bulk the body attains, and, amongst other things, to provide for the increase in the size of the uterus incidental to that age. The patients who present this softness and atonic condition of the uterus are almost invariably, according to my experience, to be convicted of non-observance of the laws of supply and demand. They are found to have

either taken too little nourishing food or to have largely and profusely expended their vital forces at this critical age, or to have erred in both particulars. From fourteen to sixteen or seventeen years of age is the period during which, for the most part, mischief is done in this way, and it is fortunate if errors of this kind do not leave their mark on the individual for the remainder of life.

Malnutrition of the uterus, then, I believe to be a very common cause of undue softness of its tissues. Whether we are to regard this softness as due to feebleness and imperfect development of the muscular elements in the uterus, or whether to regard it as an evidence of deranged nervous action, or as a proof of deficient circulatory power and lessened blood-supply, it is not essential to determine. It seems probable that it may be due to all these conjoined states, and the condition would still be fairly spoken of as malnutrition, to say nothing of its frequent clinical association with malnutrition of the other organs.

Want of tone—*atonicity*—of the organ would be an appropriate designation for softness in, probably, the majority of the cases. But in some instances we meet with *atonicity* of the uterus where there is no particular evidence of the existence of malnutrition of the uterus. I have occasionally observed the uterus to vary very much in the same patient in regard to its firmness from time to time. And in point of fact we know that the nulliparous uterus is capable of contraction and relaxation. Unquestionably, for instance, it contracts forcibly in certain cases of dysmenorrhœa when endeavoring to expel its contents. This contraction and relaxation may be regarded as normal within certain limits; when contracted the uterus is hard, when not contracted it will be rather softer. Further, it is matter of observation that the forcible dilatation of the os uteri by tents gives rise to softness of the os to a very remarkable degree.

The relation of softness to "congestion" of the uterus requires an incidental mention here, although the subject of congestion will be more fully considered later on. When softness is *not* associated with increase in bulk there is most frequently a deficient blood-supply; in fact, *anæmia* rather than congestion. But it is not uncommon to find softness of the tissues together with increase in bulk, that increase being dependent upon undue distension of the vessels with blood and what may properly be designated as "congestion" of the parts so affected. Congestion, however, *per se*, does not always present itself in association with softness; for it is quite certain that in some cases the tissues of the uterus are so forcibly dilated with blood that the organ becomes unduly hard and firm.

In nulliparous women, a large soft congested uterus is generally the result—the accompaniment, at all events—of dilatation of the cavity of the body of the uterus by retained menses or other analogous causes. The soft, *enlarged*, congested uterus is far more common in women who have undergone pregnancy.

The soft uterus is unquestionably, however, much *predisposed* to the occurrence of congestion. The circulation within the walls of the organ is feeble, the blood is itself deficient in nutritive power, and it pursues at all times a sluggish course. But little is needed under such circumstances to induce congestion of the organ. Most frequently the congestion occurs as the result of

compression of the vessels at the centre of the uterus, as explained in my last paper, and is due to the change of shape in the organ. But the softness is primarily responsible for the congestion in many such cases, inasmuch as it *allows* the uterus to take that abnormal shape. It is the unusual pliability which plays so important a part under such circumstances, and opens the way to effects which are various and wide in their ultimate issues.

Much reflection has induced me to regard undue softness of the uterus as a condition fraught with danger, and one liable to eventuate in chronic troublesome uterine disease. The existence of softness of the uterus as a primary pathological condition, and forerunner of the various effects witnessed in chronic uterine disease affecting young women, has been more and more forced on me by observation and experience, and I have derived the greatest assistance in regard to treatment from an acquaintance with its importance.

Softness of the uterus is not the result of inflammation. It is possible that in some cases there is a certain degree of *œdema* of the tissues conjoined therewith, but this is the only event in any way analogous to the effects of inflammation, and this only occurs when the condition would be properly described as "congestive."

Softening of the uterine tissues has not yet, in fact, received the attention it deserves. It is possible it may in time to come receive a name which will correctly and adequately represent its proper place and position in uterine pathology. And it is, of course, possible that in the future some other antecedent condition may be clinically recognised or discovered. But at the present moment I invite attention to it as constituting one at least of the primary pathological changes to which the uterine tissues are liable. I would submit, then, that—

1. The healthy uterus possesses a considerable degree of firmness and rigidity.
2. Softness of the uterine tissues destroys or impairs the mechanical resistance the uterus offers to change of shape.
3. This softness of the uterine tissues most frequently arises from malnutrition, and is, in fact, a local weakness, the result of an insufficient food-supply.
4. It is the primary pathological condition in a large proportion of cases of chronic uterine disease affecting young unmarried women.

(B) *Hardness*, as an abnormal condition of the uterus, is next to be considered. Undue hardness of the uterus is a condition not met with very frequently in the nulliparous organ, except in cases where the uterus is at the same time unduly large, partially or more generally. In other words, undue hardness is not common when the uterus is of its normal dimension. But it may be present in long-standing distortions of the uterus. It is one of the results occasionally met with in chronic cases of flexion, when the organ, having for a long time been the seat of irregularities of circulation, becomes, finally, enlarged in certain situations, and these enlarged portions become the seat of induration, and finally contract in that indurated state. The os uteri is the most obviously affected part, the lips of the os forming projections of a rounded, hardened character, and the edges are more or less everted. In such cases, the fundus uteri is, there is reason to believe, in like manner affected

with induration. The whole uterus, in some of these long-standing cases, is found bent, rigid, hard, resistant, and not perhaps greatly exceeding the normal size. In such instances the uterus has at some former time been the seat of swelling and engorgement at its extremities, one or both. This swelling has subsided gradually, leaving the affected parts hard and reduced, comparatively, in size.

(C) *Increase in bulk.*—This is a condition of extreme interest and importance. Normally, the uterus is undoubtedly subject to variations in size, those variations being connected with changes in the quantity of blood contained in the vascular apparatus of the organ. The functional changes in the nulliparous uterus associated with menstruation and other sexual disturbances give rise to increased fullness of the bloodvessels—denominated “erection” of the organ by Rouget, spoken of as “congestion” by others,—and produce, necessarily, some increase in the size of the uterus and add to its weight. This normal vascularity appears to affect all parts of the uterus pretty equally.

When this hyperæmia becomes prolonged beyond the functional limit, it becomes pathological. It is undoubtedly liable to become thus chronic, and the whole organ or a part of it may present this chronic fullness of the bloodvessels.

One very important clinical question here arises. What is the comparative frequency of local and general congestion of the nulliparous uterus? My own impression is that, in the majority of cases where chronic congestion and increase of size are present, the two extremities of the uterus present these conditions, whereas the middle of the uterus is comparatively bloodless. General equable congestion may be common, but I can only say I have rarely met with it. And the inference I draw from this is that general equable congestion is so rarely met with simply because this condition gives rise to comparatively few symptoms, and hence patients affected with it do not present themselves for examination. Let it be borne in mind, I am now speaking of the nulliparous uterus; for the circumstances are somewhat different in cases where the uterus has recently been enlarged from child-bearing.

The cases are common enough where congestion of the uterus, as above described, presents itself. They are cases of flexion of the organ, and we have in such cases swelling and tumefaction of the cervix and os uteri and of the fundus. This variety of enlargement of the uterus is observed in a marked degree in severe long-standing flexions of the uterus, and they constitute precisely those cases about which there has been so much controversy, the point at issue being the relation subsisting between the congestion and the flexion. My explanation of the matter I have already given—viz., that the congestion is the result of the flexion, and that it is kept up by the alteration in shape. Respecting such cases the difference in opinion may be thus represented. For the sake of argument it may be assumed that there are two congestions—one the original one, which I have alluded to under the head of undue softness of the uterus, and the other a localised, more intense form, the result of the flexion. Now, the original congestion does not by itself give rise, according to my experience, to symptoms, as a rule at least. It is

only when the flexion occurs and the localised congestion is superadded, that the patient begins to complain. Further, when the effects of the flexion are removed by treatment—i.e., by reducing the congestion by leeches or otherwise,—the patient begins to feel easy; the flexion still very possibly remaining may thus appear to be innocuous. Here we may draw a parallel. When the arm is bound up for the operation of venesection, the parts below the bandage become congested. If the bandage were allowed to remain for any length of time, the hand and arm would swell and become uncomfortable—finally insupportably so. But if leeches were applied to the hand or the veins were punctured, the bandages might remain and no discomfort would ensue. The continued removal of the superfluous blood would allow of the continuance of the bandage. The uterus is in a somewhat similar condition in cases of acute flexion. Remove the congestion of the os, and the flexion ceases for the moment to trouble the patient. Such a result is not uncommonly observed. The flexion constricts the uterus in the same way as the bandage constricts the arm.

I have repeatedly, however, performed what is a converse experiment. If, instead of taking away blood, the flexion is removed, and the uterus straightened, the induced congestion disappears; just as the swelling and turgescence of the arm subside when the bandage is removed from it: the size of the uterus diminishes. I have so constantly met with this result that it is impossible to apply any other explanation than the one above given to the facts observed.

The uterus, then, may be enlarged from presence of an acute congestion caused in this way, which congestion is for the moment undoubtedly the most important feature of the case. That this is so I have never denied, and, indeed, an admission of its importance is an essential element in the sequence of events, as I have attempted to explain them. In the nulliparous uterus the sequence of events is frequently—1. Softness (or atonicity) of the uterus. 2. Flexion. 3. Congestion, which latter is superadded, and is a consequence of the flexion. But it is occasionally—1. Congestion and increase of size without previous softness. 2. Flexion. 3. More congestion. The latter sequence of events is noticeable in cases where the patient has long suffered from undue engorgement and enlargement of the uterus from whatever cause, or where the organ has been formerly the seat of flexion and this has been partially cured. In the uterus which has been enlarged from pregnancy another kind of sequence will be observed, which is too obvious to require specific mention in this place.

All stages of enlargement of the uterus may be observed, from one where the swelling is temporary, and fullness rather than hardness is associated with it, up to that stage where the enlarged portions have become extremely hard in process of time, owing to a persistent chronic congestion and various nutritive alterations consequent thereupon. The term “arcolar hyperplasia” (Dr. Thomas) pretty accurately describes this latter condition. There is a local hypertrophy, in fact, and this may affect the uterus to such an extent that it becomes extremely distorted and inordinately heavy, while in some cases preserving its natural shape to some extent. It is rare to meet with a

well-shaped organ under such circumstances. Genuine uncomplicated hypertrophy of the whole uterus (nulliparous) is really extremely rare.

In nulliparous women, it is true, extreme degrees of enlargement *plus* distortion and hardness are not very common, but they occur sufficiently often, though in less marked degrees, compared with what may be observed in women who have had children. Needless to add that the uterus, so enlarged, distorted, and heavy, does not occupy its normal position in the pelvis. It descends forwards and backwards according to the nature of the flexion accompanying it; and when this change of place occurs to a decided extent there set in a train of symptoms familiar enough to those who are accustomed to deal with diseases of the uterus.

The question has been debated in a paper by Dr. John Williams as to how far congestion of the uterus causes or is caused by flexion of the organ. He shows that by itself congestion does not enlarge the uterus sufficiently to cause flexion, assuming that the extra quantity of blood in the organ amounts to two drachms. "It is not possible for such a small force as the weight of two drachms of blood to produce flexion of the organ." He believes, as I do, that the flexion is the cause of the congestion.

Further, the same writer draws attention to a cause of enlargement of the uterus which is interesting in this connexion. Dr. Williams believes that in many cases the uterus becomes enlarged in cases of flexion in the same way that other hollow organs become enlarged when the outlet from their cavity is obstructed; consequently, when there is flexion and dysmenorrhœa, the uterus becomes hypertrophied as the result of the increased demand on the muscular activity of the organ required in the process of expelling the blood. And it appears to me that this parallel is a perfectly just one. Facts certainly support the conclusion that increase in the size of the body of the uterus may and does occur in these cases. Whether there ensues any considerable degree of thickening in the walls of the uterus, under such circumstances, I am unable to say, for the fact that the bulk of the body of the uterus is greater than usual may depend for the most part on dilatation of the cavity. Probably there is increase in thickness to an appreciable degree; but, on the other hand, it is quite certain that the uterine cavity may be very much enlarged under such circumstances.

From what has been said, it is evident that increase in the bulk of the uterine tissues may indicate various actual tissue changes. Thus, so far as the os and cervix are concerned, it may be mere undue fulness of the bloodvessels; it may be this *plus* exudation of fluid material in the meshes of the cellular tissue—œdema. It may be due to increased deposition of solid material in the part affected (hyperplasia). It may be the latter condition *plus* temporary and removable fulness of the bloodvessels, and indeed this latter combination is frequently met with. Affecting the body of the uterus, it may indicate the presence of any one of the conditions just enumerated, with the addition that the uterine body may present a genuine muscular hypertrophy.

(D) *Diminution in bulk.*—This change, as affecting the nulliparous uterus, is not common. At least it is not common as affecting the whole of the organ. But it is a change of great fre-

quency occurring in a limited area of the uterine tissues. The atrophy and thinning of the uterine walls on the concave side of the bend in chronic flexions is a very noteworthy circumstance, and a highly important pathological fact. The substance of the uterine wall is frequently so reduced in thickness at this situation that it is hardly thicker than a piece of brown paper. About this fact there can be no doubt, as with the sound in the uterus the thickness of the uterine wall is rendered appreciable to the touch. It is more obvious in cases of acute long-standing ante flexion than in chronic retroflexion, because the anterior wall is more easily explored in this way.

This is a local atrophy of the uterus, and it is consequent, as clinical facts abundantly show, on the pressure and compression the tissues undergo at this situation in cases of flexion. It is an inevitable result in a long-standing case of acute flexion. Naturally it is absent in cases of simple version of the uterus, whether forwards or backwards. Some years ago the nature of this atrophy was much discussed by German pathologists, but that it is a secondary result of long-standing flexion does not, to my mind, admit of a doubt.

An originally weak, soft uterus, possessed of walls having an undue degree of tenuity, will, of course, be highly predisposed to this local atrophy, because it readily succumbs to pressure, becomes easily bent, and its tonicity, firmness, and rigidity being of the very feeblest description, the flexion atrophy in time occurs in a very marked degree.

For the sake of distinctness I have in the foregoing remarks on the various abnormal conditions of uterine tissues considered only the nulliparous uterus. It will be necessary now to consider the various physical changes met with in the uterus *when pregnancy has occurred.*

(A) *Softness.* After the pregnant uterus has expelled its contents at full term, it is soft, as well as of considerable size; and when an abortion has occurred the condition is the same, though the size is less. Normally, the process of "involution" reduces both the softness and the size, in accordance with laws now well known. But when the normal involution is disturbed the uterus may be found very soft a considerable time after it has been emptied of its contents. This unduly prolonged softness indicates generally weakness, slow circulation, feebleness of constitution, and slowness of nutrition. The patient slowly recovers her strength, but if well fed, and not allowed to move too soon, the uterus undergoes a change from softness to firmness, and becomes reduced in size. But the uterus may be found still very unduly soft a month, six weeks, two months, or even longer after labour.

This defective involution, associated, as it generally is, with the softness of the tissues, renders the organ very liable to undergo change in shape.

Imperfect contraction during the period immediately following the third stage of labour is accompanied with considerable softness of the organ. This is, it may be said, only a part of defective involution, but it deserves separate mention. And, as is well known, the uterus frequently contracts perfectly at first, but the contraction fails a little later, and it becomes again very soft.

Pregnancy, then, plays a very important part in conferring upon the uterus a physical quality which, if persistent (defective involution), predisposes it to various disturbances. The condition of

the soft, imperfectly-contracted uterus after delivery is in some respects like that of the uterus, soft and weak from imperfect nourishment, as sometimes observed in young women who have never been pregnant. The difference is one of degree, the uterus being, of course, much smaller in the latter than in the former case. And inasmuch as the soft, recently-impregnated uterus is large, bulky, and heavier than usual, it is more easily affected by the action of forces calculated to alter its shape and derange its position. In other words, the uterus which has recently undergone pregnancy is more liable than the nulliparous uterus to become affected with those disorders to which undue softness constitutes a predisposition.

Very many cases of chronic flexion of the uterus are distinctly traceable to slight accidents, or even ordinary exertion, acting on an organ soft and unduly pliable during the first two or three weeks following parturition. And in some cases the history distinctly shows that the malady originated within the two or three days following the labour.

Abortions are doubly interesting considered from this point of view. The abortion is frequently caused by distortion of shape, and sometimes the distortion in shape occurs suddenly, and causes the abortion. But it is certainly the fact that the abortion frequently very much intensifies an existing flexion. After the expulsion of the ovum the organ is soft, large, and pliable, and in its flaccid, empty state the uterus becomes frequently even more bent than it was before. Thus the evil may be perpetuated.

The uterus having thoroughly recovered from the effects of pregnancy, may of course, as is the case with the nulliparous uterus, become subsequently affected with softness from other causes.

(B) *Hardness.* An enlarged indurated uterus is common in chronic uterine disease where the patient has been pregnant. The hardness is accompanied with considerable enlargement in many cases. The whole cervix may be unwieldy, distorted, its lips everted, and a profuse secretion escaping from its interior. The body of the uterus is frequently in a like condition—hard, enlarged, and heavy. The uterus as a whole is hypertrophied in many instances. There are cases for the most part in which the uterus has primarily failed to contract efficiently after labour; has secondarily become affected with change of shape; and, in the third place, has become the seat of those chronic hypertrophic nutrition changes which were formerly spoken of as chronic inflammation, but for which some such designation as “areolar hyperplasia” is more appropriate. The mechanism of the process by which these results are reached is in no wise different in kind from that which is observed in the nulliparous uterus, but it differs in regard to its results; for the bulk of the affected parts is much greater when the disorder follows pregnancy or abortion than under other circumstances. It is not uncommon, for instance, to find the uterus three times its normal size a year or two after the termination of a particular pregnancy, the cervix large, hard, hypertrophied, and altogether abnormal in shape, concurrently with which the organ is the seat of very decided flexion; and an examination proves that the body of the uterus is equally enlarged, hard, and indurated. There are necessarily great variations in different cases, for the hardness is sometimes exchanged temporarily for softness; further congestions occur

from time to time, producing some degree of softening and additional enlargement, and when the congestion a little subsides the part affected is left hard and resistant.

There may be found considerable hardness, with slight enlargement of the uterus, without change of shape to any great amount, for it is by no means a *necessary* effect of defective involution of the uterus that it should undergo a change of shape. Whether that happens or not will depend on circumstances. The defective involution leaves the uterine framework, so to speak, large; it hardens in that enlarged state, this condition persisting perhaps for months, and even for years.

The degree of hardness observed varies. Sometimes the uterus possesses a quite stony hardness, the cervical portion presenting rounded projections of considerable size, very firm to the touch. In process of time these hard portions may become still harder. The hardness is most intense when there is an associated chronic flexion present. These hard nodular enlargements of the cervical portion alter the natural shape of the os uteri to a notable degree. Dr. Henry Bennet some years since differentiated them from a condition with which they were formerly liable to be confounded—viz., the early stage of uterine cancer.

(C) *Increase in bulk.* This, as already remarked, is frequently associated with undue hardness, particularly when the malady has existed for some time. But increase in bulk is often attended also with greater softness than ordinary. The defectively involuted uterus is large and soft at first. It is subsequently large and *hard*. In regard to mere size, all degrees of it may be encountered when flexion is associated with it; the enlargement is most marked at the two extremities of the uterus, and it is unnecessary here to explain the mechanism of its production, this being the same whether the patient has been pregnant or not. The difference is, however, great in degree, for the organ is rarely found anything like so large in the nulliparous subject as when pregnancy has formerly occurred. Cases are exceedingly common in which the patient is found to have an enlarged, distorted uterus, which sometimes presents considerable softness, but at other times is found to be hard and resistant. The organ contains much blood, its vessels are increased in size; it is the seat of repeated congestions, which alternately appear and disappear. The organ grows by the continual additions that are made to its bulk as the result of these repeated congestions, until it attains a very considerable magnitude. The body of the uterus is not unfrequently found so heavy that it is altogether at the mercy of external forces. The uterine stem, narrowed at its middle, offers a quite inadequate resistance to further flexion. The disorder is thus perpetuated, each successive attack of congestion leaving the organ more and more helpless.

Thus it happens that in women who have had children the uterus is frequently so much enlarged that its bulk renders treatment difficult in a greater degree than is the case with nulliparous subjects.

The obstacle which a coexisting flexion offers to the return of the uterus to its normal size after parturition is very great. I have had opportunities on several occasions of appreciating this difficulty in cases where the uterus has suddenly become flexed within a short time after the occurrence of labour. The involution is very greatly retarded by the occurrence of the flexion, and in

like manner in the chronic cases of conjoined flexion and enlargement I have found the great obstacle to the reduction of the enlargement is the flexion. When the uterus has become much hardened, as well as flexed and enlarged, the difficulty is proportionately increased. But nevertheless it is a fact, which I have over and over again observed, that the diminution in the bulk of the enlarged uterus which occurs when the organ is straightened is very frequently quite remarkable. The explanation, of course, is that the processes of nutrition, circulation, and absorption go on much more readily when the uterus possesses its natural shape. There is nothing very wonderful in this, but the very simplicity of the explanation seems to be a barrier to its acceptance with many.

The very great importance of enlargement of the *body* of the uterus as a factor in the majority of actual cases comes out more and more as clinical observation is extended, more especially in the case of women who have had pregnancies. Unquestionably this condition was formerly frequently overlooked, but there is no doubt that it will come to be regarded with more and more attention in the future. The appreciation of the existence of this enlargement is sometimes not easy. The increase in the size of the cervical portion of the uterus is recognised readily enough, but unless the enlargement of the body of the uterus be looked for, circumstances are such that it will be frequently undetected. Not rarely the cervical portion is only slightly enlarged, while the body of the uterus is very much increased in size, and unwieldy to a degree.

Here another practical remark may be made. It is my experience that enlargement of the body of the uterus is far more commonly overlooked when the organ is ante-flexed than when it is retro-flexed. One reason is that the body of the uterus is more readily felt by the touch in cases of retro-flexion than in cases of ante-flexion. But another is that careful exploration through the roof of the vagina by digital examination is too often omitted. Perhaps the most common case which presents itself in ordinary practice is that of a patient who has had pregnancies and who has since become affected with enlargement of the uterus, ante-flexion, anteversion, and descent of the whole organ below its natural position in the pelvis. The facts lie before us, and it does not require a highly skilled observer to appreciate them. It is only necessary to insist on the investigation covering the whole ground; these abnormal conditions will not then so frequently be altogether unnoted and unrecognised.

According to my experience, cases are not very common in which the body of the uterus is much enlarged *unaccompanied* with change of shape (of course fibroid enlargements are here excluded from consideration), and this is an important argument for the truth of what has been above said regarding the connexion between the distortion and the enlargement.

(D) *Diminution in bulk.* On this subject little remains to be added to what has already been stated respecting the nulliparous uterus. The cases of super-involution of the uterus described by Simpson come under this category, but they are very rare. The local atrophy, limited to the seat of the bend in cases of flexion, is, however, very important. See previous remarks on the nulliparous uterus.

## EXPLANATORY REMARKS ON THE TREATMENT OF STRICTURE OF THE URETHRA AND GLEET.

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(Concluded from August Number, p. 364.)

POINT 6TH.—“Stricture is most frequent in the first inch from the meatus, and is less frequent as the distance from the entry increases.” Mr. Hill dissents from this proposition, and says: “In 258 strictures Dr. Otis found 115 in the first inch and a quarter, and the remainder in decreasing frequency in each succeeding inch. This, you know,” says Mr. Hill, “is contrary to the received doctrine, which places stricture most frequently at the bulbo-membranous part. My own view does not support Dr. Otis’s statement. In 1870” he says, “I recorded 63 strictures examined with bulbous sounds at the Male Lock Hospital in 1869, when I found them 43 times between four inches and a half and six inches.” I would simply recall the fact that, at the date of these examinations, the *urethrometer* had not been devised, and consequently in all cases where the meatus was of less size than the deeper urethra no efficient examination was possible; and all strictures of larger calibre than the external orifice of necessity escaped detection. Had the explorations been conducted from behind forwards, as with the *urethrometer*, I feel quite confident that a difference of opinion on this point would not have been recorded. In all cases of stricture of gonorrhoeal origin, we might infer, *a priori*, that the stricture would occur most frequently where the inflammation had been most intense and prolonged—i.e., at the anterior portion of the canal. Strictures from lithiasis, masturbation, excessive venery, traumatism, &c.,\* would naturally be expected in the deeper portions of the canal. The fact that no thorough examination of the urethra, with reference to stricture, can be made without the *urethrometer* must, I think, make it necessary to throw out all recorded results as to the exact number, size, and locality of strictures when the explorations have been conducted by means of instruments of uniform size, or even with the bulbous sound or bougie alone.

In regard to the seventh point—viz., that “complete division of stricture and maintenance of the normal urethral calibre, until the incision is thoroughly healed, prevents return of the contraction, and, moreover, causes absorption of the indurated tissue from the affected part,” I am able to add five additional cases to the thirty-one referred to by Mr. Hill, where, out of 100 cases reported, this number was demonstrated to be absolutely free from stricture upon a thorough re-examination, at periods varying from a few months to three years and a half from the dates of operation. Mr. Hill’s observation of sixteen cases has left him in doubt as to whether or not “permanent absorption” follows *complete division* of stricture. Previously to citing the results of operation in these sixteen cases (fifteen operated on by him—

\* See Thompson on Causes of Organic Stricture. Eng. Ed. p. 115.



self and one by me), Mr. Hill alludes to my method of operating on stricture for the cure of gleet. He says: "A patient applies for the cure of gleet. His gleet must be the consequence of stricture. Find that stricture; cut it completely through to the erectile tissue, so as to make the urethra a little wider than before, and take care to maintain this artificial patency while the incision is healing. *The cure is then permanent and complete.*" Now, if Mr. Hill were speaking of the cure of stricture instead of gleet, the description of the method could hardly be improved; but to say that the cure of a gleet is immediate, complete, and permanent, after the operation on the stricture, is what I do not desire to claim. I would be understood as holding that *stricture is the cause of gleet*, and that *its removal* is necessary to the permanent cure of gleet. I have already alluded to conditions, implications of deep follicles and sinuses, &c., which may prolong the gleet indefinitely after the cure of the stricture. The removal of the stricture or strictures is the *first* condition of permanent cure of gleet, and in the *majority of cases*, after this is accomplished, the gleet will cease, without other treatment, in from one to four weeks after the healing of the wounds. But in exceptional cases the condition before alluded to—the legitimate results of stricture in certain individuals—will keep up the gleet for an indefinite period, and must be treated on general principles, final success depending upon the character of the especial complication, the knowledge, skill, and ingenuity of the surgeon in charge of the case.

Finally, Mr. Hill proceeds to consider the results of operation on his sixteen cases, all of which he fairly states were in individuals "who had long-standing gleets, with contraction in one or more parts of the spongy urethra, and had undergone multifarious treatment." Strictures were examined for, and found. They were operated on in supposed accordance with the method previously described, and five out of the sixteen cases operated on by Mr. Hill were promptly cured of both stricture and gleet. A sixth operated on by me was reported cured after five months "by other means." In the remaining ten recontraction of the strictures took place, and the gleet persisted. Why? Evidently because of the recontraction of the strictures. And why did the recontraction take place? Why did the strictures disappear completely in five cases and reappear in ten? Simply, as I apprehend, because in case of the latter *the strictures were not completely divided*. This is not remarkable, it seems to me, under the circumstances, although Mr. Hill used his own ingenious modification of my dilating urethrotome, and observed all the principles necessary for the successful performance of the operation in these ten unsuccessful cases. *Complete* division of stricture, in my experience, cannot be demonstrated at the time of the operation. A certain amount of distension is necessary to fix the stricture before it can be completely divided; hence a sufficient time must elapse after the operation to test the question as to whether the strictures are, or not, completely divided, and this is never less than ten days or two weeks. If after this time an examination with the full-sized bulbous sound shows complete freedom from stricture, there need be (judging from my own experience) no fear of any return of stricture. If, on the contrary, remains of stricture are detected, it is the evidence of incomplete division, and the

operation must be repeated, and the remaining fibres severed. Without *complete and absolute sundering of the stricture* to its ultimate fibre, recontraction sooner or later is *certain*. It is not a question of using my urethrotome or Mr. Hill's, or any other special instrument, but one of principle. It is not a question of whether division of strictures may be effected by one operation or ten; neither the permanent cure of stricture nor of gleet can be reasonably expected while a fibre of the stricture remains undivided. Let the sundering be complete, and proven by a re-examination at a period sufficiently long after the operation to give security against mistaking *over-distension* for *complete division*, and I will not hesitate to take the responsibility of claiming ultimate *absolute permanent* removal of urethral strictures.

In describing my urethrotome Mr. Hill is somewhat in error. He says: "A small cutting edge, previously concealed at the end of the dilating part, is drawn along the tightly stretched tissue to the meatus, ..... making a long furrow in the mesial line in the roof of the urethra." He further says: "Disliking this long cut, which divides uncontracted parts, I have employed, except in one case, a stricture incisor which, while it stretches the urethra to the size previously determined, cuts only where it is strictured." My object has always been to divide *only* contracted tissue. Strictures have been carefully located and measured before operation. The knife which is concealed at the end of my instrument is drawn through the stricture and at once returned to its concealment. If other strictures are present, the instrument is especially readjusted for them.

Mr. Hill records against my mode of procedure "persistent bleeding" in four cases; "rigors" in three; "abscess in the buttock" in one; "curvature of the penis" in one; "orchitis" in one. This certainly looks like a formidable array of accidents to occur in sixteen cases. 1st. In regard to "persistent bleeding." This accident, if accident it can be termed in cases where vascular tissues are freely and intentionally incised, may always be readily and easily controlled. Simple compression by an ordinary bandage will always stop it in the spongy portion of the urethra. The introduction of a flexible tube after the operation will always prevent it. The magnitude of the object to be attained will warrant the employment of either or both of these simple measures in every case, and will give security, perfect and complete, against any injury from hæmorrhage. 2nd. "Rigors" occurred in three cases. The simple passage of any instrument through the curved or fixed portion of the urethra may alone suffice to produce this accident, and would be still more liable to result upon dilatation of this part. My plan is never to pass beyond the bulbous urethra if it is possible to avoid it, and my own urethrotome has been contrived expressly with the view of dividing strictures, as far as the bulb, *without entering the fixed portion of the urethra*. Acting on this principle, rigors have not occurred in more than one out of a hundred cases, in my experience. From this I am able to state that all operations confined strictly to the penile urethra are virtually free from danger of this accident, or from any marked constitutional disturbance, except in cases habitually subject to this trouble. 3rd. "Abscess of the buttock" is recorded against one operation. This might be accepted as account-

ing for the rigor which it may be presumed occurred in this case, but cannot be entertained as the result of any operation upon the penile urethra. 4th. "Orchitis" followed the operation in one case. Orchitis is recognised as occurring not unfrequently from the simple passage of any instrument through the curved portion of the urethra. I have never met with it as the result of any interference with the spongy portion of the canal.

In one of Mr. Hill's cases—that operated on by myself—persistent bleeding is noted, and notwithstanding the assiduous passage of sounds, his gleet persisted for five months ("until Christmas"), and was then cured by other means; and, besides, a scar or induration remained in the erectile tissue which gave a crook to the organ on erection. It seems to me not irrelevant to state that this case was operated on by me in the theatre of the University College Hospital under the impression that he was to receive care immediately after the operation. It turned out, however, that he was an out-patient. He subsequently drove his van for several miles, then walked a couple of miles, and returned at about 10 P.M. to the hospital, was subjected to treatment for his hæmorrhage, and had some constitutional disturbance for several days. I think this inflammatory complication, which undoubtedly caused the induration in the erectile tissue, would rarely occur in cases where the necessary care and rest are insisted on.

Out of between five and six hundred operations I have seen six cases followed by the crook or curvature to which Mr. Hill alludes, in the worst case persisting about a year; but in all of these inflammatory trouble succeeded the operation. In two a urethritis was present, which had persisted acutely for several months, and in the others extensive, very dense, and deep strictures were divided. It is a question whether this rare accident would ever occur if the strictures were uniformly divided on the floor of the urethra, as Mr. Hill is in the habit of doing. My cases were all cut superiorly and in the median line, as I believed I could more certainly sunder the strictures in this way, and with less liability to troublesome hæmorrhage. I am at present making observations with the view of ascertaining the best point for division, and I may ultimately coincide with Mr. Hill in incising strictures on the inferior floor of the canal.

The final cure of gleet in the last-mentioned case is stated to have taken place five months after my operation, "by other means." At the date of operation it was one of the "cases of long standing, with contraction in several portions of the canal, and had resisted multifarious treatment." Is it quite certain that this case was finally cured by other means, and that the cure was not chiefly due to removal of the strictures? I rather incline to the opinion that the continuation of the gleet was due to the "cicatrical knot" which followed the operation and complicated the case; and its gradual absorption (usual in such cases) removed the remaining source of irritation, and the gleet ceased. In Mr. Hill's own fifteen cases one-third were promptly cured. In the remaining ten *recontraction* took place: this, it appears to me, is a good and sufficient reason why the gleet should persist; and I feel confident that the results of *thorough* redivision of these strictures would go far to establish the truth of my views.

In closing his lecture, Mr. Hill objects to any examination of the urethra for stricture until the

gonorrhœa and gleet shall have lasted for six months. It is a well-known fact (see Thompson "On Stricture," English edition, p. 115) that strictures are often present from other causes than a gonorrhœa, that a gouty or rheumatic diathesis &c. may cause them, and that even a first gonorrhœa is often aggravated and prolonged by it. Is it, then, wise to ignore for a long period a well-recognised cause of trouble when the alternative is a prolonged, and possibly a useless, if not harmful, course of urethral injections and nauseous medicines? However much we may deprecate unnecessary instrumentation, we cannot lose sight of the fact that unnecessary *injections* are quite as much to be deprecated. A careful, judicious, and thorough urethral examination, immediately after the acute stage of a gonorrhœa has passed, I have never found to result in more than a temporary discomfort, and less than often follows the use of a single injection. I do not claim perfection for any method or means of mine, but I offer my instruments and experiments to the profession, abroad and at home, with the sincere hope that they may be tested in the fair and generous spirit shown by my friend Mr. Hill, and that ultimately we may arrive at the solution of the most vexed of all surgical problems—viz., the best way of curing stricture and gleet.

New York.

## A SHOE FOR THE TREATMENT OF CLUBFOOT.

By RICHARD BARWELL, F.R.C.S.,

Surgeon to Charing-Cross Hospital.

I DESIRE to describe a form of shoe by which the less severe distortions of the foot may be successfully combated without any other treatment whatever, which is, while being worn, hardly perceptible, and which permits the patient to walk and run about with ease. It was, however, designed, and is especially useful as a succedaneum to what has become named "Barwell's treatment of clubfoot," concerning which a few words will be said in the sequel. There comes in this treatment a period when, certain shortened muscles having been sufficiently stretched, the foot requires but little force to keep it in position, and when exercise of the limb becomes desirable. Dr. Lewis Sayre, following out my principle of acting chiefly on the front half of the foot by elastic force, devised a shoe, which he showed in this country in 1870. A precisely similar arrangement has been described by Mr. Dixon, who, as he did not mention the previous invention, was not, we must suppose, aware that the shoe had then been made by Messrs. Weiss for many months.

The principle of the Sayre shoe may be described as a division into two at the waist of the foot of an ordinary boot, the two parts being united together at the sole by a ball and socket. The heel compartment carries two leg-irons united at the top by a calf-piece, whence india-rubber springs act on the front of the boot and on the foot inside it.

Two slight modifications were made at my suggestion by Messrs. Weiss with considerable advan-

tege—namely, substitution of a pivot and two hinges for the ball and socket, and the introduction of india-rubber sheeting at the gap between the two parts of the sole so as to prevent the entrance of water to the foot and of grit to the joint. Nevertheless, certain disadvantages remain which I have obviated by a different form of boot, in the carrying out of my plan having been ably assisted by Mr. Hawksley.

The sole of the shoe is made of steel (plate-gauge No. 21), and is divided into two parts at a level with the medio-tarsal joint; the line of division must not run straight across, but in both parts must incline obliquely from the middle line to allow of play between the parts (Fig. 1, *b, d*);



along the margins the metal is perforated with small holes for convenience of stitching.

The posterior part (*d*) must be made rather narrower than the tracing of the foot, and must be bent up behind corresponding with the shape of the lower surface of the heel; to this part is attached the upright of which more hereafter.

The front portion (*b*) must be made considerably narrower than, and not quite so long as, the tracing of the foot. On each margin, a little behind the place where the metatarso-phalangeal joint will come, a small steel wire bracket is placed. This portion and the heel part are jointed together by a somewhat peculiar mechanism made of sufficiently thick steel wire (gauge No. 15). That half of the joint which is to be affixed on the lower surface of the heel-plate is made by bending a piece of the wire till the centre forms a bow, while the straight ends lie, about one-third of an inch apart, parallel. The bow must be accurately semicircular, and is to be bent down till the plane of the bow and that of the parallel lines lie at a right angle to each other (Fig. 2, the white portion). The other part of the joint is made of equally thick wire, bent upon itself so as to enclose the semicircle above described. It is essential that this wire be bent in the manner depicted (Fig. 2, the dark portion)—that is, the upper limb must be perfectly straight. If the whole limb be curved like the link of a chain the joint misses its object; the front half of the sole will not rotate round the straight wire in the middle line, but will move round the semicircle, thus the middle line diverges to one or the other side and the joint gets "jammed."

The rest of the steel foundation consists of the upright; this is hinged close down to the edge of the heel-plate, always on the outer side. From the hinge a stiff portion runs upward from an inch to an inch and a half, according to the size of the foot. It must be concave, and so bent outward as not to press, not even to touch, the limb when *in situ*. The rest of the upright part is a spring which carries the calf piece; it is curved outward for varus, inwards for valgus. Fig. 3 represents it as for the former deformity, and in such cases there is fixed to the pivot on which the

hinge rotates, therefore always stationary, a minute ring or hook. The calf-piece carries on each side an eye to which a small chain is attached.

All the steel sole, back and front, are separately covered with strong canvas, and to these parts are attached the lappets for lacing on the foot. These must be well made to measure, so as not quite to meet, and the foot must be protected from the laces by an inner tongue for each portion. The back part must be well hollowed out above the heel, to prevent the foot lifting away from the sole. The shape of the front lappets must be well looked to; their posterior edges must be in a straight line with each other, or even diverge a little backwards (Fig. 1, *a, c*). This is very important, and I have had some difficulty in enforcing this point, makers and coverers being apt to make the upper free edge of the canvas equal in length to the edge which is sewn to the sole. A shoe thus made will fail.

In putting on this shoe the back portion must be laced first, taking care to place the steel heel well at the bottom of the patient's heel, whether it be turned inwards or outwards. Place the shoe in the same posture as the foot, but do not press the foot straight to fit a horizontally placed shoe. The same thing must be said of the front half: it is to be bent or twisted to the posture of the foot, and so laced. The spring of the upright is now to be brought in position, and the calf-piece strapped round the leg. When all is fixed, an india-rubber spring—a very small accumulator of  $\frac{1}{4}$ -inch cord, on which two steel hooks are bound—is to be stretched with proper tension between the chain suspended from the calf-piece and the little bracket on the inner side, if the case be valgus; on the outer, if it be varus. It is convenient, generally, not to fix the hook directly into the little bracket, but to a loop of catgut passed through it. In the case of varus, also, a piece of catgut is passed from the bracket backwards through the little ring or hook at the hinge, where it bends at a right angle, running thence upwards to a small accumulator, after the direction and manner of the peroneus brevis tendon.

When this shoe has been made, a bootmaker must measure over it for an ordinary high or Polish boot. If he be a good tradesman he will make a pair whose slight difference in size will be hardly perceptible, and the height of the boot will conceal the whole mechanism. The weight of the inner or mechanical shoe is so slight that it may practically be disregarded; one now on my table, which is used by a child of six, weighs three and

a quarter ounces. The bootmaker, by letting the sole of the outer boot be a little thinner—to compensate for the thickness of the inner boot—can easily equalise the balance of the two feet.

This shoe is a most valuable aid to the treatment of clubfoot by elastic extension, a method which has gained and is gaining ground with thoughtful surgeons, to whom ultimate results are of the highest importance. It is with satisfaction that I can point to several hospitals and to many surgeons whose testimony confirms this,\* rather than controvert by my own personal experience the strongly expressed opinions of Dr. Buchanan.

## A NOTE ON SENILE PNEUMONIA.

By JAMES GREY GLOVER, M.D. Edin., &c.

THERE has been a very satisfactory advance of knowledge of late years in regard to acute pneumonia. This remark applies to our knowledge of its natural course, its seat, its tendency *not* to cause death, when primary, occurring in subjects previously healthy and not old, and when not treated antiphlogistically or in any other way extremely. This fact is the more important, as pneumonia represents the whole class of acute primary inflammations, of which it is one of the most common, as it used to be, if it is not still, the most fatal. The writings of Dr. John Hughes Bennett on Pneumonia, based as they are on a very large and accurate clinical experience, and showing a splendidly successful result of treatment, are of the greatest value, and they do great honor to English medicine. Since then Dr. Wilson Fox has well sustained the credit of our literature on this subject by his able exposition of it in his article—probably the best systematic account we have—in “Reynold’s System of Medicine.”

I have nothing to add to these accounts of the subject in general. Like all other practitioners, I am struck with two features of the disease: first, its tendency to terminate in a crisis—especially a sweating crisis—days before the disappearance of the physical signs of consolidation; and secondly, its tendency to terminate favorably when not over-treated. My simple object in the present note is, by the record of three recent cases, to encourage a hope that the progress of time may justify the application of these two propositions to the case of pneumonia in old people. Old people have been rather excluded from the benefit of our more hopeful views of the disease. Dr. Wilson Fox quotes Prus to the effect that of 129 cases whose age exceeded sixty, 77, or 59 per cent., died. In a table of 2618 cases, by Huss, from which Dr. Fox quotes, there are only 4 cases between seventy and eighty, of which 2, or 50 per cent., died. In Dr. Bennett’s marvellous table of 125 cases of simple acute pneumonia without a death, there is but one case at sixty and but one at seventy. He gives no other cases above sixty but these. These figures seem to show that the disease is not very frequently seen at high ages—at any rate in hospital practice.

I happen to have seen within the last few months, in private practice, three cases of pneumonia in

female patients at the respective ages of seventy-five, seventy-nine, and sixty-seven. These have all recovered, though they were all very ill; and I confess that their recovery—perhaps partly due to their sex—surprised me and gave me new faith in the chances of recovery and in the use of a certain line of treatment in such cases. The cases were briefly as follows. I only give such details as indicate the nature of the case.

CASE 1.—Mrs. M—, aged seventy-five, had, on the 15th December, a prolonged and severe rigor. At my first visit there was little to be made out, in connexion with this, but a loud bruit nearly all over the chest. The next morning the temperature was 100·2°; in the evening of this day 101·2°, with an approach to bronchial breathing at the middle part of the right chest posteriorly. The next morning there was a temperature of 102°. This temperature was never exceeded. On the fifth day the bronchial breathing and dulness on percussion at the above part were marked. There was some wandering at nights. From the fourth day, for four or five days, the pulse was more or less intermitting. On the sixth day of the disease, in the morning, the temperature was 100·2°, and the pulse 102 and intermitting. On the seventh day, the temperature was 99·8°, the pulse continuing quicker than it should be, and on the evening of this day I had the pleasure of finding the temperature 98°, the pulse about 90 and less intermitting. The progress of recovery was slow. There was a slight bed sore. The dulness and bronchial breathing continued at least ten days after the temperature fell. Nervous symptoms, particularly sleeplessness at night, which had been somewhat troublesome before this illness, persisted; but she gradually recovered her ordinary strength and health, and is now very well.

The treatment was simple. Confinement to bed of course. The continuous application of linseed poultices to the affected side; citrate of potash in solution, with a few minims of spirits of ammonia and nitric ether; beef-tea and milk, and after the first two or three days, two or three spoonfuls of brandy, or a corresponding amount of sherry every three hours.

CASE 2.—Mrs. M—, in her seventy-ninth year, had a rigor on the 5th of March. Sent for me on the 6th. Found her with a temperature of 101°; severe cough; harsh respiration over the upper right apex posteriorly; and the pulse, as is frequently, if not habitually, the case with her, intermitting. The tongue had the genuine pyrexial fur. The treatment was very much as in the previous case. On the 9th of March a little champagne was ordered. On the 16th she was convalescent, though the pulse was intermitting. Though the breathing was never distinctly bronchial in character, it was distinctly harsh, and the attack had all the essential clinical characters of pneumonia of the apex, and was creditably surmounted at seventy-nine.

CASE 3.—I was asked to see Mrs. D—, aged sixty-seven, late on the night of May 29th, 1876. Found her feverish, and with rusty sputum, but could not get any distinct history of a rigor. The next morning, on the 30th, the temperature was 102·4° F., there was decided bronchial breathing, increase of vocal resonance, and dulness at the middle of the right lung posteriorly. In the evening the temperature was 102·8° F., the sputum viscid and rusty. On the morning of June 1st the

\* To Mr. E. Lund, in his opening address on “Science in Surgery”; to Mr. Marshall of Nottingham; and others.

bronchial whiff had given place to large crepitation. In the evening the temperature was 103°, and there was headache and much distress. I attributed this increased temperature and discomfort partly to the effect of four grains of carbonate of ammonia, which I had added to her mixture in the morning. I now discontinued this, and returned to a simple mixture of citrate of potash, nitric ether, and a few minims of ipecacuanha wine. For some days following she continued ill, with more or less fever, tongue thickly furred, and sometimes dry, a good deal of pain on the affected side, and some looseness of the bowels. On the evening of June 4th she felt very ill. Temperature 100·8°; pulse 108; breathing tight, and coughing painful; tongue thickly furred and dry; bowels loose. To have a little ice to suck, and a mixture with aromatic confection and bismuth. On the morning of the 5th temperature was 99°; the edges of the tongue were cleaning. She had found the ice a great luxury. In the evening the temperature was 99°. She "feared she was no better," but her dress was wet with perspiration, and the pulse slower, though intermittent. On the 6th at 10 A.M. the temperature was 97·6°. The pulse was very irregular, the heart beats being about twice as many as the pulsations of the radial. This want of correspondence between the heart and the pulse constituted a marked and somewhat anxious feature of the disease till the 9th, when it is noted that the pulse was 72, without irregularity, and in perfect harmony with the cardiac pulsations. During this period brandy was given with water, at the rate of a dessertspoonful every three hours. The only troublesome symptom now was night cough, greatly relieved by a five-grain pill of ipecacuanha and squills. On June 13th the note is, "Râles over the right side posteriorly; feels weak, tongue clean." A little quinine was ordered, with a few minims of diluted sulphuric acid. On the 15th the respiratory murmur was clear, and free from râles, and the patient felt stronger. From this time the recovery needs no comment. [Since writing the above my patient has had, but is now recovering from, an attack of subacute rheumatism, affecting the hands, wrists, and shoulders. She had so far recovered from her pneumonia as to leave her room, and has now no chest symptoms but a slight cough. Her pulse is regular, about 70; temperature 98°. She has never had rheumatism before; but a sister has suffered much from it. The feet are not affected. It will be noticed that between the attack of pneumonia and this rheumatic condition there was a clear interval of defervescence and convalescence of nearly a fortnight.]

*Remarks.*—I need add little to the above record. My belief is, that during the pyrexial period the best treatment is a cooling and sustaining one—that of simple salines with beef-tea, milk, water; and, if there is great heat or feeling of heat, a little ice may be swallowed from time to time. Over the affected part I invariably order a large linseed poultice to be kept, and renewed every three or four hours. When the period of crisis comes, no time should be lost in giving such moderate doses of stimulant as seem to help, and not to heat, the patient. The thermometer and the pulse together will guide the judicious practitioner in regard to the dose. I have seen nothing to indicate the good of such quantities of stimulants throughout the disease as Todd used to give; but facts of the kind above given, and the sensa-

tions of the patient, leave little room to doubt that a moderate allowance of alcohol at the time of crisis, or a little before, is to be regarded as a part of the "food convenient" for such cases. The prostration of the patient at this time, at whatever age, is generally very great, and, in elderly people especially, very apt to be fatal.

Highbury.

## ACUTE GENERAL HERPES.

By CLEMENT DUKES, M.B., B.S. Lond., M.R.C.P. Lond.,

Medical Officer to Rugby School.

As the above-named disease is exceedingly rare, the following clinical account of a well-marked case may not be without interest to many. Some authors do not even mention its existence; while Dr. Tilbury Fox remarks in passing that Dr. Contagne, of Lyons, has recorded cases. The following notes are only those taken hurriedly at the bedside:—

Mr. B—, aged seventeen—subject to urticaria, and having a mitral systolic murmur,—while out in the rain on Oct. 17th, 1874, got wet, and stood in front of the fire, with his clothes on, to dry them. He says he was only wet up to his knees.

On Oct. 18th and the following days, had aching all over, but especially in the limbs; did not feel well; had no catarrhal symptoms.

Oct. 22nd.—Aching very much worse; so bad was it that I anticipated an attack of rheumatic fever. At 5 P.M., I was asked to see him again, and found him with a pulse of 120, and a temperature of 102°; skin hot and burning; acute pain in diaphragmatic region, which proved only neuralgic, and not inflammatory, as I expected it would have done. He had a hot bath, and went to bed.

23rd.—Awake all night; very restless; pain at diaphragm continued.—At 2 P.M. a redness of the skin was seen, in raised patches, all over the body, somewhat like urticaria; face and hands swelled; skin very irritable, not itching, but sore and tingling; could scarcely bear the bedclothes to touch the skin anywhere. On looking more closely, the red inflamed patches were raised in small vesicles in clusters, not all over equally alike, but in certain parts, in characteristic crops of herpes vesicles filled with clear fluid, these occurring especially well-marked on the back of the hands, elbows, knees, feet, and several clusters of a dozen each on the walls of the thorax.

24th.—Many more of these vesicles in clusters all over the body in various parts; also on the face, beside the nose, but not on the lips, and occurring, too, all over the hairy scalp and forehead. Those vesicles seen yesterday are much more distended with clear fluid. There are no vesicles on the palms of the hands, but only red patches as large as a threepenny piece. The chest-walls are smothered with vesicles in small crops, but in no case do the crops seem to follow the distribution of nerves; they are most irregular in their situation. Isolated vesicles only on abdomen, back, and thighs, scattered here and there, but the redness, bright scarlet, is so extensive as to form almost one con-

tinous red surface. On the soles of the feet are red patches only, but on the dorsum a great many vesicles. On the inside of the mouth, on the tongue, soft palate, and well into the pharynx, vesicles are seen.

25th.—Sweating profusely where the skin is not covered with the redness or crops of vesicles, but as this normal skin only exists as interstices between these patches (so full are they), it presents a very curious appearance. Therefore the skin presents the following character: red patches with crops of vesicles on them; red patches dry on surface; and normal skin threading its way between these, quite wet with perspiration. The redness is beginning to fade, and the vesicles are shrinking and several bursting, leaving no scab, but only the cuticle that had been filled with fluid, lying lax on the surface and dried.

26th.—Still more fading and absorption.

28th.—Most of the vesicles gone, and the redness become darker in color. On the back, where there had been no vesicle detected—that is to say, well raised, bright and glistening from the fluid,—I could distinctly see and feel not only raised red patches, but on these patches small pimples but not blebs, doubtless owing to a small amount of fluid under the cuticle. The red patches have assumed such peculiar shapes that it is quite impossible to describe them, but they make the skin look anything but as it should.

29th.—There are fresh crops of vesicles on the chin and beside the nose, also some on the ear and inside the nose, not noticed before; some still visible on the soft palate and tongue. There has also been a vesicle at the end of the penis, and there is now a crop of fresh-looking vesicles on the scrotum. The fluid from the vesicles is alkaline and clear. The red patches are becoming smaller and darker, and much resemble the fourth day of the rash of measles, so blotchy are they. On looking closely at what have been the larger red patches, they are disappearing in rings, exactly resembling the way that ringworm grows—that is, they become brownish-yellow in the centre, with a reddish ring encircling it.

30th.—A few fresh vesicles on the chin and nose, which resemble in appearance the ordinary herpes from cold, but no vesicles at all on the lips. Has severe pain again in abdomen.

Nov. 3rd.—Skin desquamating all over, more or less, in large and small scales. The patches with yellowish centre and red ring surrounding are very marked, but they are all manner of shapes and sizes. Fainted while at night-stool; slept much after.

6th.—Skin still peeling; convalescent.

His treatment was salines at first, with Dover's powder to relieve the pain; subsequently he had the mineral acids with bark, and then quinine. This illness, together with the mitral disease, was the cause of a very great debility, extending over some months.

## AN ALTERNATIVE OPERATION FOR VESICO-VAGINAL FISTULA.

By C. F. MAUNDER, F.R.C.S.,

Surgeon to the London Hospital.

CAROLINE A—, forty-one years of age, the

mother of eleven children, was delivered of the last about twelve months ago, by means of instruments. Inability to retain the urine has existed ever since. Recently Mr. William Powles was consulted, and found the patient to be the subject of a vesico-vaginal fistula. By his advice surgical aid was sought, but operative interference with the fistula was declined by three surgeons who saw her. Ultimately I was consulted, and found a large opening in the floor of the bladder the size of a five-shilling piece, while the surrounding structures were tense and cicatricial. The patient's condition was naturally sufficiently wretched, and she had scarcely dared to venture out of doors since her confinement. I declined to attempt to deal with the fistula, but proposed to close the vaginal outlet in order to stop the existing incontinence of urine.

The records of this operation are scanty, but the author of one of the text-books on surgery says he has performed it twice "with good success, two or more operations being required."

It is intelligible that the chief obstacle to union of the raw surfaces would be the accumulation of urine in the vagina tending either to irritate or to burst asunder these. To obviate this accident, and a repetition of the operation, I adopted a plan similar to that of puncture of the bladder per rectum in the male.

*Operation (May 4th).*—This consisted in dissecting off a thin layer of mucous membrane, at least an inch and a half in depth, of the outlet of the vagina, a large catheter being retained in the urethra, whilst the under surface of this was being pared. Quill sutures were used as in the operation for ruptured perineum. As soon as all bleeding had ceased, the recto-vaginal septum was penetrated just behind the raw surface, obliquely from before backwards with a trocar and canula introduced per anum. The trocar was withdrawn, and a winged catheter having been passed through the canula, the latter was removed, and the end of the catheter left in the vagina. The sutures were now twisted, and the operation was completed. Half a grain of opium was ordered to be taken night and morning.

May 7th.—Progress very favorable. The bed is perfectly dry, the urine flowing freely through the catheter, which projects at the anus. Removed the sutures.

9th.—This morning, the catheter having become accidentally plugged, the urine was retained, and the patient, instead of sending for Mr. Powles, sat on the pot de chambre and strained to make water, and with the effect of forcing apart the feebly united surfaces. On this day, at my usual visit in the afternoon, I had intended to remove the winged catheter, expecting to find that it was no longer required. I now determined to give up all idea of primary union, and to trust to healing by granulation: To secure this I deemed it desirable to reintroduce sutures and also to replace the soft by a metallic tube in the rectum. Accordingly, after giving the patient a few days' rest, and getting the bowels open, this was done on May 15th.

26th.—Removed the sutures.

30th.—The tube was removed early this morning, and the bowels were freely relieved by an aperient and an enema.—5 p.m.: The bladder has not been emptied since the morning, but the new septum is water-tight, although the desire to micturate is great. The water is to be drawn off

periodically per meatum, and, if desirable, she will be taught to use the catheter herself.

*Remarks.*—A short silver tube (No. 14 catheter size) answered the purpose of conducting the urine better than the smaller and soft instrument, as it never became plugged, although on removal there was a thick coating of phosphates on its interior. I was somewhat anxious lest a permanent fistula might result from the use of this tube, but there was at no time any evidence of the passage of urine into the rectum, neither has this occurred since the removal of the tube. With the hope of preventing this, I, on each occasion, perforated the recto-vaginal septum *obliquely*. I ought also to state that I introduced the silver tube through the septum by means of a Thompson's bivalve tracheotomy lancet. Throughout the treatment the patient experienced no inconvenience whatever from the tube in the rectum, and the position she was thus able to assume was a most independent and comfortable one.

P.S. June 8rd.—To-day I was informed that a few hours ago the patient found that her water again dripped from her. On inquiry it appeared that the nurse had used the catheter as usual, and soon after the patient noticed that she was wet. On examination I found a small opening large enough to transmit a No. 6 catheter leading into the vagina, just below the position of the meatus, and doubtless made by an improper use of the catheter. Notwithstanding the annoying circumstances connected with the case, I believe puncture per recto-vaginal septum will prove of great value.

Queen Anne-street.

## ZWANK'S PESSARY.

By CLEMENT GODSON, M.D.,

Assistant Physician-Accoucheur to St. Bartholomew's Hospital;  
Physician to the Samaritan Free Hospital for Women  
and Children, etc.

In the treatment of diseases of women, among the poorer classes, we meet with a large number of cases for the relief of which Zwank's pessary is the best adapted. I allude to those in particular in which the uterus has been completely procident for a length of time, where there is an absence of support in the soft parts, no fat, and frequently but little or no perineum. All the varieties of Hodge's pessary, especially Greenhalgh's improved form with bars, are tried, but directly any force is exerted upon them by straining or coughing, they are immediately expelled, and the only pessaries which are likely to be retained are either the trumpet shape with braces attached, or the Zwank. The former is, as a rule, strongly objected to by the patient on account of the braces, while the latter is almost always declared free from discomfort, and there is none more popular among this particular class of women.

But every variety of Zwank hitherto in use has its objections. Speaking of them as a body, it is said that they are dangerous as liable to give rise to pressure upon the soft parts, causing fistulous communications with the bladder and rectum. Such is certainly the case if they be left in for a length of time without removal, but such a com-

plication is impossible if, as should always be directed, they be removed each night after retiring to bed and replaced in the morning before rising.

The real objections are, however, with regard to the material of which the pessaries are constructed, and the mode of fastening. First, there is that form which is kept together by means of elastic tubing. This is the most objectionable variety of all, though largely employed on account of the price. The rubber is sure to split sooner or later, and under any circumstances it becomes full of and sodden by the secretions, and, therefore extremely fetid. A better form is that made of vulcanite, which is fastened by means of a screw, but it is frequently broken by being over-screwed, the discharges get in the interstices of the screw, and it cannot be released, and often the adjacent hairs get entangled, giving rise to considerable pain. And so Zwank's pessary with many has got into disuse.

To obviate these objections I have contrived a form of Zwank, which has been manufactured for me, and registered, by Messrs. Arnold and Sons, of Smithfield; and it has already proved to be a very useful pessary. It is shown in the accompanying illustration. The upper part is made of

vulcanite, and is extremely cleanly, light, and durable. The lower portion, or feet, employed for locking, is made of metal. Directly these feet come in contact, with the slightest pressure they lock; and they are as easily released by pressing with one finger upon the spring, and at the same time pushing the curved extremity down with the thumb. It may be suggested that this portion will give pain by pressing externally, but this, in practice, will be found not to be the case. The patient walks about and sits down with perfect comfort. The expense—a very important item—is very little more than that of the cheapest form, while it will last out at least three or four of these. It is considerably cheaper than those varieties worked by means of a screw, whether made of vulcanite or metal.



## DESCRIPTION OF A

## SPLINT FOR USE AFTER EXCISION OF THE KNEE.

By VICTOR A. WARTENBERG,

Junior House-Surgeon, Manchester Royal Infirmary.

I BEG to submit to the notice of the profession a splint I have had constructed for application to the leg after the operation of excision of the knee-joint. It fulfils the following conditions:—1st. It allows perfect adjustment of the cut ends of the bones. 2nd. It ensures perfect immobility after adjustment. 3rd. It permits free access to the joint for the purpose of dressing the wound.

From the woodcut it will be seen that the splint consists of three parts—viz., a thigh, a leg, and a popliteal portion.

The thigh portion consists of a wooden back splint, which extends from immediately below the buttock to within three inches of the centre of the knee-joint. On its anterior surface is fixed a layer of "Hide's felt," which is so cut as to envelope the thigh. The edges of the felt are supplied in front with hooks, so that it may be laced up.

The leg portion likewise consists of a wooden back splint, which extends from three inches below the centre of the knee-joint to the foot. About

all hæmorrhage is arrested, the femoral portion of the splint, with the felt well soaked in varnish, is applied to the thigh and laced up the front. The leg portion is then put on and fixed in a similar manner, and, the surgeon fixing the cut ends of the femur and tibia in the position required, an assistant tightens up the thumb-screws, and the whole limb is thus fixed and the joint rendered perfectly immovable.

As will be seen from the woodcut, there is ample room for any form of dressing. The apparatus is adapted for united fractures and other injuries requiring complete immobility and perfect adjustment of the ends of bones.

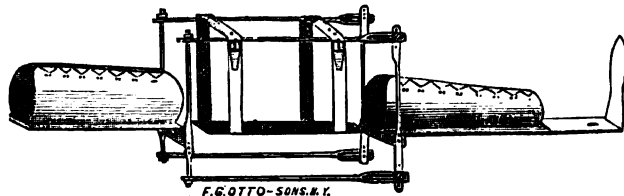
The splint is manufactured by Messrs. Wood, of King-street, Manchester.

## ON THE PRESERVATION OF ICE AT THE BEDSIDE.

By SAMUEL GAMGEE, F.R.S. Edin.,

Surgeon to the Queen's Hospital, Birmingham.

THE luxurious comfort and practical benefit which many patients derive from the frequent ingestion of ice are well known. To those who can



three inches from the heel the foot-piece is attached to the leg-splint by a hinge, after the plan adopted by Mr. Callender. To the anterior surface of the leg-splint is attached Hide's felt in exactly the same manner as to the thigh-splint. At the distal extremity of the thigh portion, and at the proximal extremity of the leg portion, the posterior surfaces of the wooden splints are grasped by strong cross pieces of wood, which project on either side about two inches. At each extremity of these cross pieces is attached a metal upright, eight inches in height, seven inches of which project on the anterior surface of the splint and one inch on the posterior. These uprights are connected by four horizontal bars fixed by a screw and nut at the thigh end, but supplied at the leg end with a running slot and thumb-screws. This arrangement enables the two splints to be connected and adjusted at any angle, and, by simply tightening the screws, to be retained in that position.

The popliteal portion is simply a wooden back splint, four inches long, to which two straps and buckles are attached. After the dressings are applied to the wound, this splint is applied and buckled across the two top horizontal bars, and thus affords additional support to the popliteal space. This portion of the splint is removed at each dressing.

The mode in which the splint is applied is as follows:—When the operation is completed and

command a constant attendant, and to whom cost is no consideration, it is comparatively easy to secure a constant supply of little lumps of ice at the bedside; but, even under these favorable circumstances, it not unfrequently happens that in the warm bedroom, towards the small hours of the morning, when the bit of ice is most wanted to suck or to be put into milk, water, or other beverage, it is found to have melted, and time is lost and perhaps the household disturbed before a fresh supply can be obtained. This is frequently the case when the lumps of ice broken for use are kept in a glass or saucer in the room. My practice for some years has been to cut a piece of flannel, about nine inches square, and secure it by ligature round the mouth of an ordinary tumbler, so as to leave a cup-shaped depression of flannel within the tumbler to about half its depth. In the flannel cup so constructed pieces of ice may be preserved many hours, all the longer if a piece of flannel from four to five inches square be used as a loose cover to the ice-cup. Cheap flannel, with comparatively open meshes, is preferable, as the water easily drains through it and the ice is thus kept quite dry. When good flannel with close texture is employed, a small hole must be made in the bottom of the flannel cup, otherwise it holds the water, and facilitates the melting of the ice, which is, nevertheless, preserved much longer than in the naked cup or tumbler. In a room 60° F., I made the following experiment with four

tumblers, placing in each two ounces of ice broken into pieces of the average size for sucking. In tumbler No. 1 the ice was loose. It had all melted in two hours and fifty-five minutes. In tumbler No. 2, the ice was suspended in the tumbler in a cup made as above described of good Welsh flannel. In five hours and a quarter the flannel cup was more than half filled with water, with some pieces of ice floating in it; in another hour and a quarter (six hours and a half from the commencement of the experiment) the flannel cup was nearly filled with water, and no ice remained. In tumbler No. 3 the ice was suspended in a flannel cup made in the same manner and of the same material as in No. 2, but in No. 3 a hole capable of admitting a quill pen had been made in the bottom of the flannel cup, with the effect of protracting the total liquefaction of the two ounces of ice to a period of eight hours and three-quarters. In tumbler No. 4, two ounces of ice were placed in a flannel cup made, as above described, of cheap open flannel (10d. per yard), which allowed the water to drain through very readily. Ten hours and ten minutes elapsed before all this ice had melted.

A reserve supply outside the bedroom door can be secured by making a flannel cup, on the plan above described, in a jug, and filling it with little lumps of ice; care being taken that there is space enough below the bag to allow the water to collect, and leave the ice dry. This provision will allow ice to be used during the hottest night, without the supply failing, or the patient being disturbed—two very important considerations. The real therapeutic benefit of ice is only produced in some cases by its free use, and its soothing and stiling effect must be aided by the most perfect surrounding quiet.

The matter is a comparatively trifling one; but its public notice will, I feel certain, be excused by those who know from experience how much comfort may be given by attention to trifles in aid of greater resources, and often long after these have ceased to be operative.

Birmingham.

#### CASE OF CLEFT HARD AND SOFT PALATE, OPERATED ON BY LANGENBECK'S METHOD; RESULT PERFECT.

By GEORGE BUCHANAN, M.A., M.D.,

Professor of Clinical Surgery, University of Glasgow.

DAVID S—, aged twenty-two, was admitted to the Western Infirmary Nov. 26th, 1876. There was a congenital cleft in the palate involving the whole of the soft and half of the hard palate. The anterior end of the fissure was quite rounded, and the margins of cleft in the hard palate were three-quarters of an inch apart. The tips of the bifid uvula were drawn asunder by the palatine muscles.

The operation was performed after the method introduced by Langenbeck, closure of the hard and soft palate being accomplished simultaneously. The patient, not being put under the influence of chloroform, was able to give great assistance, by holding his head at a proper angle and occasionally stopping to rest and wash his mouth. From the help of the patient the proceedings were much more rapid and satisfactory than usual.

I first carefully made raw the entire edges of the gap by cutting off a thin slice of tissue from the hard palate, to the tips of the uvula, on both sides, taking care that the raw edge was continuous throughout. I then made an incision down to the bone, in the roof of the mouth, close within the alveolar process, extending from the hamular process forward to near the incisive foramen. Then with a blunt periosteal elevator of a hooked form I stripped the soft tissues, including the periosteum, from the palate processes of the maxillary and palate bones, and the flap so separated hung down like a curtain from the roof of the mouth, but of course supported by its attachment in front and behind. This was done on each side. The posterior part of the cleft, however, still remained too far apart to allow of approximation without considerable tension, so I relieved this by making incisions through the soft palate on each side, as in Dieffenbach's operation. The edges of the cleft could now be drawn together throughout the whole extent. Six silk threads were introduced by the ingenious method introduced by Sir William Fergusson, and finally by these, fine silver wires were drawn through and tied. At the end of the operation the gap was seen to be closed throughout in a most satisfactory manner.

On the eighth day the silver sutures were removed, and the edges found to be firmly adherent.

The patient was kept in the hospital for some time longer in order to see that the granulation of the side wounds should not reopen the cleft.

Two months after the operation the palate was firmly closed throughout its whole extent. Already patient felt the difference in swallowing, and the improvement in his articulation was manifest. In fact, when he paid proper attention he could speak in such a way that his former deficiency was scarcely recognisable, and there is no doubt that by a little practice he will still further improve.

The operation, so far as regards the union of the cleft, and the result, both on swallowing and speech, is the most successful in my experience, and leaves little to be desired.

Glasgow.

## A Mirror

OF

## HOSPITAL PRACTICE, BRITISH AND FOREIGN.

Nulla autem est alia pro certo noscendi via, nisi quamplurimas et morborum et dissectionum historias, tum aliorum, tum proprias collectas habere, et inter se comparare.—MORGAGNI *De Sed. et Caus. Morb.*, lib. iv. Proœmium.

### ST. MARY'S HOSPITAL.

CASES OF RHEUMATIC FEVER TREATED BY SALICYLIC  
ACID.

(Under the care of Dr. SIEVEKING.)

THE beneficial action of salicylic acid appears to have been almost constant in the subjoined cases,

for the notes of which we are indebted to Mr. Jackson Gawith and Mr. H. Sworder. Its chief effect was the great relief of pain.

CASE 1.—E. S—, a cook, aged twenty-three, admitted April 28th, suffering from subacute rheumatism. She was taken ill on the 24th, with pain in the shoulders and back; then pain, heat, and swelling of the left knee and foot, and some pain in the chest; and afterwards pain in the left wrist, never had rheumatism before. On admission, the tongue was furred; bowels constipated; pulse 108; temperature 99.4°. Left knee swollen and painful; right ankle hot and painful. Loss of appetite was complete; and she was quite unable to walk. There was no morbus cordis. Ordered simple diet, milk and beef-tea. After the bowels were thoroughly opened by castor oil, she was ordered twenty grains of salicylic acid every hour for six hours. At 10.30 P.M., after four powders, the temperature was 98.4°, the pulse 88, and there was very little pain; so the other two powders were omitted.

April 29th.—Slept very well; had not slept for two or three nights before. Temperature at 10 A.M. 99°; pulse 120. No pain except on moving the joints; right ankle not so hot and not at all painful; left knee less swollen, and she complained of pain in it only on moving it about pretty freely. She said she felt well enough to be up and running about. Urine: specific gravity 1030; large quantity of lithates; no albumen. Ordered to take two more powders of twenty grains each. Temperature at 10 P.M. 98.4°.

30th.—Slept well. Temperature 99.2°; pulse 100. No pain except a little in the knee; she could move it about freely.—10 P.M.: Pulse 96; temperature 98°.

May 1st.—Slept well. Temperature 98°; pulse 98. Very anxious to get up. Dr. Sieveking, on seeing her, said, "She has no pain anywhere except in the knee, and then only on firm pressure over the outer condyle of the left femur and on brisk movement." Tongue moist and clean; bowels open. She asked for beef-steak.—Evening: Temperature 98.4°; pulse 88.

2nd.—Morning: Pulse 104; temperature 99.2°. As there was no return of heat and pain in right knee, three powders of twenty grains each were ordered.—5 P.M.: Temperature 98.4°; pulse 104. There was much less pain, and she was very hungry.—8.30 P.M.: Temperature 98.6°; pulse 88. 11 P.M.: Temperature 97.8°; pulse 80. No pain whatever.

3rd.—Temperature 98.6°; pulse 88. No pain except on very firm pressure over outer condyle.—10 P.M.: Temperature 98.4°; pulse 100. Ordered fried sole.

4th.—Pulse 100; temperature 98.4°. Feels well. No pain anywhere.

5th.—Morning: Pulse 100; temperature 98.4°. To get up a little.

6th.—Temperature normal. Gets about the ward.

9th.—She went out of the hospital to-day perfectly well.

CASE 2.—Joseph N—, aged sixteen, baker's boy, admitted April 28th, 1876, suffering from subacute rheumatism. Was taken ill two weeks before with pain and swelling of most of his joints; notably, the ankles, knees, and hips.

On admission, there was much pain, heat, and swelling of right knee. The right ankle was hot

and painful, but not much swollen; the left knee and ankle had quite recovered. He had also some pain in arms. No morbus cordis. Had had rheumatism before. Temperature 100.6°, pulse 88. Ordered simple diet; milk and beef-tea; twenty grains of salicylic acid every hour for six hours. Bowels were well open in the morning. At 8 P.M., after two powders, temperature 100.2°; pulse 92. Sweats very little. Pain now only present on moving the affected parts; no feeling of sickness.—11.30 P.M.: Pulse 84; temperature 98.6°. Sweating profusely. Very little pain.

29th.—9 A.M.: Pulse 88; temperature 99.2°. Slept very well; very little pain anywhere.—1.20 P.M.: Pulse 84; temperature 99.6°. Very little pain in right knee; can bend it up and allow it to be pulled about without pain to him much. Very little pain in the right ankle, a little still in the arms. Urine: specific gravity 1010, slightly acid, no albumen. The salicylic acid to be taken three times a day. 10 P.M.: Temperature 99.6°; pulse 68. Very little pain, except on moving the joints.

30th.—11 A.M.: Pulse 64; temperature 98.6°. No swelling or pain in knee or ankle; can move them about freely; tongue moist and furred.—Evening: Pulse 72; temperature 99.2°.

May 1st.—Pulse 64; temperature 99.2°. No pain worth mentioning; can move his legs and wrists freely; wants to get up.—Evening: Pulse 56; temperature 98.2°. No pain anywhere. Sleeps well.

2nd.—Pulse 60; temperature 98°. No pain. Ordered fried sole for dinner.—Evening: Pulse 64; temperature 98.2°. No pain.

3rd.—Morning: Pulse 80; temperature 99°. Some slight return of pain in knee, so ordered the salicylic acid every hour for three hours.—3 P.M.: Pulse 62; temperature 98.8°. Early this morning he could not bear the tendons of right ham to be touched; they now can be pulled about without pain to him in the least. Wants to get up.

4th.—Seems quite well. No pain. Temperature normal. Walks about perfectly well.

5th.—Quite convalescent.

12th.—Discharged to-day cured.

CASE 3.—J. L—, aged twenty-four, porter, admitted on the 28th of April, suffering from subacute rheumatism. Taken ill on the 24th with pain in both hams, in the hips and shoulders; high-colored urine, &c. Never had rheumatism before; had gonorrhœa two years ago. On admission, he complained of severe pain in the ham and back part of the right thigh, also in the hip-joints; no swelling of knee-joints. The most severe pain, and this was excruciating, was at the back of the right knee-joint among the hamstring tendons. Bowels open; tongue furred; no appetite; no morbus cordis. Pulse 100; temperature 101.2°. Urine acid, sp. gr. 1030, trace of albumen. Ordered simple diet, milk, and beef-tea, half an ounce of castor oil at once, and followed by twenty grains of salicylic acid every hour for six hours. At 8 P.M., after two powders, the temperature was 101.2°; pulse 104; less pain; sweating profusely; felt a little sick. At 11.30 P.M., having had all the powders, the temperature was 100.4°; pulse 100; pain now hardly worth mentioning; still sweating profusely.

April 29th.—Slept fairly well. Much less pain in knee and thigh, but fresh pain in shoulders. Sweats very much. Temperature 99.8°; pulse 104 (9 A.M.)—1.10 P.M.: Pulse 96; temperature

101.4°. Shoulders very painful. Twenty grains of salicylic acid three times a day.—11 P.M.: Pulse 86; temperature 100.6°. Sweating very much; very little pain; can move his legs about easily.

30th.—Morning: Pulse 84; temperature 100.2°. Very little pain. His right knee may be bent without his complaining of pain.—10 P.M.: Pulse 80; temperature 100.2°. As he had much pain in arms and right leg he was ordered the salicylic acid every hour for three hours. At midnight the pain was much better, and he slept well.

May 1st.—Pulse 84; temperature 99.2°. Can move his legs and arms about pretty freely without pain, and he is now reading in bed. Bowels open; tongue clean and moist. Complaints of being very hungry. To discontinue the powders.—10 P.M.: Pulse 72; temperature 99.2°. No pain whatever in legs, a little in shoulder.

2nd.—Morning: Pulse 68; temperature 98.6°. No pain anywhere; right shoulder stiff. Ordered fried sole.—Evening: Pulse 70; temperature 98.6°. Stiffness only in both shoulders.

3rd.—Morning: Pulse 72; temperature 99.2°. Stiffness only in shoulders; no albumen in urine.

4th.—9 A.M.: Temperature 99°; pulse 80. Can move his shoulders freely, but there is more pain in them. Ordered salicylic acid, twenty grains every hour for three hours.—11 A.M.: Pain all gone, and sweats profusely. Temperature 98.2°; pulse 72.—10 P.M.: Temperature 99.2°; pulse 76.

5th.—Morning: Temperature 97.6°; pulse 76; only stiffness in shoulders.—Evening: Temperature 99.2°; pulse 76.

6th.—Morning: Temperature 100.2°; pulse 92. Was up two hours this afternoon.—Evening: Temperature 99.4°; pulse 80.

7th.—Morning: Temperature 99.2°; pulse 76. No pain. Evening: Temperature 100.2°; pulse 84.

8th.—Morning: Temperature 99.6°; pulse 84. Swelling and pain in right hand and wrist. Ordered twenty grains of salicylic acid every hour for four hours.—12.10 P.M.: Temperature 101.2°; pulse 78.—10 P.M.: Temperature 101°; pulse 88. Much less pain.

9th.—Morning: Temperature 100°; pulse 88. Some pain in right wrist. Ordered a blister (three inches by three) to it; ten grains of calomel and colocynth pill, to be taken at night, as well as five grains of iodide of potassium and fifteen of bicarbonate of potash in water three times a day. Evening: Temperature 99.8°; pulse 80.

10th.—Morning: Temperature 99.8°; pulse 100. Only a little pain in right shoulder.

11th.—Some pain in right wrist and finger-joints. Temperature 98.8°; pulse 80.—Evening: Temperature 98.8°; pulse 80. Ordered a diet of two pints of milk. To be up some hours.

12th.—Temperature 98.8°; pulse 82. None the worse for being up; walks about perfectly well; no pain anywhere except a little in finger-joints of right hand.

13th.—Temperature 98.8°; pulse 70; no pain except on firm pressure over finger-joints.

14th.—Gets about well; no pain anywhere.

17th.—He went out to-day quite convalescent.

CASE 4.—Fanny J., aged twenty-seven, married, was admitted April 29th, suffering from rheumatic fever. She was taken ill on the 23rd with pains in the limbs and chest; the ankles, knees, and hands were particularly swollen. She had loss of appetite, great perspiration, and constipation. Never had rheumatic fever before.

On admission she was in very great pain, and could not be moved without screaming, the knees and ankles being especially painful; there was, however, very little swelling of knees and ankles; the wrist-joints were very hot, swollen, and painful; there was also much pain and heat in the shoulders; no morbus cordis. Temperature 103.6°; pulse 120. She was ordered simple diet—two pints of milk, one pint of beef-tea. Bowels were well opened by some castor oil and an enema, and then, at 5.30 P.M., salicylic acid was ordered in twenty-grain doses every hour, for six hours. Temperature at 7 P.M., 102.4°; pulse 116. There was much less pain in knees and ankles, about the same in wrists and shoulders; she sweated profusely, and still had pain in chest and back. Urine strongly acid, sp. gr. 1030, containing a trace of albumen.—10 P.M.: Temperature 101.4°; pulse 112; no pain in knees and ankles, and very little in wrists; sweated profusely.

April 30th.—Pulse 120; temperature 100.4°. A little pain in knees, and her hands and arms feel very stiff. Can move her wrists about freely; no morbus cordis. To take the salicylic acid three times a day.—10 P.M.: Temperature 100.6°; pulse 104.

May 1st.—Slept very well; tongue less furred; bowels open. Temperature 99.6°; pulse 88; no pain anywhere except in right shoulder; she can move her feet, legs, and shoulders very well (on admission she was perfectly helpless).—Evening: Temperature 99.6°; pulse 84.

2nd.—Temperature 99.2°; pulse 80. As she had some pain in the wrists and shoulders she was ordered three powders of twenty grains of salicylic acid, one every hour for three hours. After the second powder the pain nearly all disappeared.—Evening: Temperature 98.2°; pulse 84. Very little pain now.

3rd.—Temperature 98.4°; pulse 80. Only has stiffness in right shoulder.—Evening: Pulse 80; temperature 98.8°.

4th.—Pulse 80; temperature 99°. Less stiffness.—10 P.M.: Pulse 86; temperature 99°. Slight pain in knees. Ordered broth diet.

5th.—Pulse 84; temperature 98.8°. Only some stiffness in arms. Does not like broth diet, so ordered simple and fried sole.—Evening: Pulse 84; temperature 99.4°. Some pain in right arm and wrist.

6th.—9 A.M.: Pulse 96; temperature 100°. The pain being worse in the right wrist, ordered three powders (twenty grains), one every hour for three hours.—11.30 A.M.: Pulse 88; temperature 99°. Sweating much; less pain.—10 P.M.: Pulse 84; temperature 99.2°. No pain anywhere.

7th.—Pulse 84; temperature 99.8°. Very little pain in the right wrist.—4 P.M.: Pulse 100; temperature 98.8°. Quite free from pain.—10 P.M.: Temperature 99.6°; pulse 84.

8th.—9 A.M.: Temperature 99.4°; pulse 84. As there is a little pain in the right wrist, two powders are ordered to be taken as before.—11.30 A.M.: Temperature 100.2°; pulse 96. No pain now; she is very hot, but not perspiring.—10.30 P.M.: Temperature 99.2°; pulse 84. No pain.

9th.—Pulse 96; temperature 99.8°. Some pain and heat in left wrist. To take the salicylic acid every hour for four hours.—10 P.M.: Temperature 98°; pulse 80. No pain.

10th.—Pulse 80; temperature 98.4°. No pain.—Evening: Temperature 98.2°; pulse 84. Or-

dered five grains of iodide of potassium and ten of bicarbonate of potash in water twice a day.

11th.—Temperature 99°; pulse 104. She got up in the evening, and walked about pretty well.

—Evening: Temperature 99°; pulse 100.

12th.—Temperature 100°; pulse 84. No pain anywhere.—Evening: Temperature 98.2°; pulse 84. Ordered one ounce of quinine mixture three times a day.

13th.—She walked about pretty well yesterday. Temperature 98.8°; pulse 88.

20th.—Since the 12th her temperature has been perfectly normal, and she has had no recurrence of pain. She left the hospital this afternoon quite convalescent.

**CASE OF FRACTURE OF BOTH CLAVICLES, AND OF THE THREE UPPER RIBS ON THE RIGHT SIDE; WITH PERMANENT ARREST OF THE CIRCULATION THROUGH THE RIGHT SUBCLAVIAN ARTERY; SUBSEQUENT DEVELOPMENT OF BONE, RESEMBLING EXOSTOSIS.**

(Under the care of Mr. JAMES LANE.)

For the following interesting notes we are indebted to Mr. Sworder, house-surgeon.

A boy, aged fifteen, was admitted Dec. 18th, 1875, in an alarmingly collapsed condition. In attempting to get out of a train in motion he had slipped, and had been crushed between the carriage and the platform, having been dragged onwards for several yards. He was put to bed at once; stimulants were given, and a hot bottle was applied to his feet. In an hour or two he had recovered somewhat from the collapse, but his breathing was much embarrassed. Examination revealed fracture of both clavicles, the right being broken a little internal to its centre, with the outer end driven downwards and inwards upon the first rib. The three upper ribs on this side were also broken at about their centre, fracture of the second and third being made out at once by examination of the axilla, that of the first becoming evident subsequently during the progress of the case. The left clavicle was broken just outside the attachment of the coraco-clavicular ligaments, the short outer portion being so displaced that the acromial end was directed obliquely downwards and forwards, as is usual with a fracture in this situation. The skin over both scapulae was extensively lacerated. The compressing force seemed to have operated upon the shoulders from behind, and to have forced them forwards and inwards, causing both clavicles to give way, and then on the right side expending itself on the upper ribs.

The patient was placed on his back, with his head and shoulders slightly raised, but his inability to bear any pressure on the chest, together with the laceration of the skin over the scapula, rendered it impossible to apply bandages to keep the fractures in position. The arms were simply brought to the side with the forearms folded over the abdomen and fixed there by a bandage very lightly applied. The wounds on the back were treated with simple dressing.

On the next day there was extreme distress and difficulty of breathing, with much fever. His pulse was 160, respiration 60, and temperature 103°. He was therefore ordered to be bled from the arm, and though only three ounces of blood could be obtained this was attended with marked relief, for in the evening the pulse had fallen to

180, the respiration to 40, and the temperature to 99.4°.

Dec. 21st.—The breathing was less embarrassed. Temperature 100°; pulse 180; respiration 84. Bowels were freely acted upon. It was now found that there was no pulse to be felt at the right wrist or in any of the arteries of that limb, and the boy complained also of numbness in the right little finger. The subclavian artery was doubtless compressed by the broken clavicle against the first rib, and the lowest nerve of the brachial plexus was interfered with to a slighter extent by the same means.

On the 24th he was going on well. Pulse 108; respiration 82; temperature 99°. He was quite unable to move himself, and complained of great difficulty in breathing when raised to have the wounds over the scapula dressed. Any attempt to improve the position of the clavicles was attended with so much pain and distress that it was at once abandoned. The application of bandages or axillary pads for this purpose was obviously out of the question. The pulse at the right wrist could not be restored by any movement which it was possible to make at the right shoulder.

From this time he slowly improved, but it was not until three weeks after the accident that he was able to sit up in bed without distress. By that time the fractures appeared to be consolidating, and the wounds on the back were granulating healthily. On Jan. 25th, 1876, he was allowed to walk about the ward a little, and his diet, which had hitherto consisted of beef-tea, milk, and eggs, was changed to "ordinary." On Feb. 15th he was well enough to leave the hospital, but was directed to attend twice a week as an out-patient.

At the date of his discharge, eight weeks after the accident, all the fractures seemed firmly united; both arms could be moved to a limited extent without causing him pain. In the right clavicle there was overlapping of the fragments to the extent of three-quarters of an inch, the outer piece being depressed upon the first rib, and the prominence of the shoulder on that side being obviously diminished. By examination from the axilla, the seat of fracture of the three upper ribs could be made out. There was no return of pulsation in the vessels of the arm. On the left side, the short acromial portion of the clavicle was directed forwards and a little downwards, and rode slightly over the inner fragment; the latter having been maintained in its normal position by the coraco-clavicular ligaments.

Four months after the accident the boy had regained free movement of both shoulders, and seemed perfectly recovered. Since he left the hospital, an elongated hard substance had been developed at the lower part of the neck on the right side, parallel with the outer border of the sterno-mastoid muscle. It passed behind the clavicle, and seemed to be firmly fixed at its lower end. It caused no pain or inconvenience. The most probable explanation of this would seem to be that the bony matter thrown out for the union of the fracture of the first rib had extended upwards in the nature of an exostosis in the tendon of the scalenus anticus muscle.

*Remarks.*—Simultaneous fracture of both clavicles is a rare injury. Malignant could only meet with six recorded examples of it; and, singularly enough, in three of these no union took place. In one of the six, one clavicle was broken directly by

a blow, and the other indirectly by a fall on the opposite shoulder consequent upon the blow. In another the first fracture was caused by a fall, and the second by the wheel of a carriage passing over the opposite shoulder. In a third both the fractures were caused by transverse compression operating upon both shoulders at the same time. Hamilton records four cases of double fracture out of 158 fractures of the clavicle in the New York Hospital. None of these, however, were accompanied by fracture of the ribs, which proved so serious a complication in this case, and prevented the adoption of any measures to keep the fractured clavicles in position. Fracture of the first rib is equally rare, this bone being so well protected by the clavicle, the pectoral muscles, and the shoulder that it can hardly be reached except by a very powerful compressing force after the clavicle has given way.

Injury of the subclavian vessels and of the brachial plexus of nerves has been occasionally met with, but in most cases it has accompanied comminuted fractures produced by direct violence. Mr. Holmes mentions a specimen in the museum at St. George's Hospital, showing the internal jugular vein punctured by a fragment of the clavicle; and the death of the late Sir R. Peel was caused by an injury to the subclavian vein produced in the same way. Mr. Erichsen has recorded a case in which compression of the subclavian vein by a broken clavicle rendered amputation at the shoulder-joint necessary. Mr. Bryant mentions a case of fracture of the clavicle followed by arrest of pulsation in the artery of the corresponding arm. In the case here recorded, the fracture of the first rib in the immediate neighborhood of the artery may have contributed to its obliteration.

Injury to the nerves, causing paralysis more or less complete, seems to be more frequent than injury to the vessels, but it has generally been associated with severely comminuted fractures. In many cases it has not appeared till some time after the accident, and may have been the result of too tight bandages and too large an axillary pad. In this instance the damage to the nerve must have been slight, for the symptoms speedily passed away.

### UNIVERSITY COLLEGE HOSPITAL.

CASE OF INTESTINAL OBSTRUCTION; GASTROTOMY;  
DEATH.

(Under the care of Mr. BERKELEY HILL.)

For the notes of the following interesting and remarkable case, and the remarks, we are indebted to Mr. A. P. Gould, surgical registrar.

L. D—, aged ten, was admitted on January 25th, 1876, with the following history:—Patient was in her usual health until January 23rd. At 3 P.M. she carried a child up fifty steps, but appeared quite well after it; at 5 P.M. she had a motion, and immediately afterwards complained of pain in the abdomen and nausea. She would not take any tea. At 7 P.M. she vomited, and the vomiting continued at short intervals until admission on the evening of the 25th. The vomit was said to have become faecal for the first time that

morning. The pain was severe all this time. Poultices and turpentine stupes were applied to the belly, and on the evening of the 24th an enema was given, which brought away two or three scybala, and, according to the mother's account, a good quantity of blood, enough to deeply stain all the fluid. No motion or flatus passed spontaneously, but there was very distinct gurgling heard by the mother. The child often complained of ineffectual attempts to defecate, and of frequent desire to micturate.

On admission, the child complained of great pain and tenderness in the abdomen, especially on the right side. She vomited stercoraceous matter. The abdominal walls were lax; no swelling could be detected in either groin, or at any of the seats of external hernia. There was no discharge from the rectum, and nothing could be felt on digital examination therein. An enema of two pints of water was administered, which brought away some hardened lumps of faeces and a very small quantity of blood. After this the sickness stopped for four hours; it then returned again. Hot fomentations were applied to the abdomen, and at 9 P.M. ten drops of tincture of opium were given. When seen by Mr. Hill at 10 P.M., the child was calmly asleep, the abdomen was not tense, moving freely in respiration; the pulse was quick, and of fair force. Shortly afterwards the child woke up, and vomited mucous non-stercoraceous fluid copiously. At midnight a second dose of ten drops of tincture of opium was given.

Jan. 26th.—After the second dose of opium the patient slept soundly for six hours, was then sick, and the sickness continued more or less all day. The vomited matter consisted of the milk the patient drank, with greenish bile, but towards evening it became again slightly stercoraceous. At 9 A.M. an examination of the belly gave negative signs. The flaccid abdominal walls permitted the hand to trace the position of the viscera; no tumour could be felt in the course of the great intestine or elsewhere. Pain was referred to the left of the umbilicus, and this part was also tender when handled. The finger in the rectum detected no swelling or unnatural condition. The rectum was empty; no blood was passed. The pulse was of good force, and the abdominal movements were natural. The patient lay indifferently in several positions, and sat up in bed without difficulty. Temperature: 7 A.M., 98°6'; 4 P.M., 99°4'; 7 P.M., 98°6'. Ordered half a teaspoonful of brandy every four hours, and five drops of tincture of opium as might be required; it was given about every three hours.

27th.—The patient has a very pinched aspect. Complains of a good deal of pain round umbilicus, and in right iliac region; not tender. The vomiting, which is not stercoraceous, still continues, occurring about once every half-hour, very scant in quantity, often little more than sputa from the mouth. In the morning she was ordered to be fed with nutrient enemata only; at 4 P.M., these enemata, being instantly defected, were discontinued, and milk or Brand's essence of meat every half-hour, with half a teaspoonful of brandy every two hours, were substituted. Two grains of calomel and half a grain of opium at once. At 7.30 P.M. eight drops of tincture of opium were given, and repeated twice at intervals of three hours each, after which the patient slept quietly for some

hours, and was not sick. Temperature at 10 A.M., 98° 8'; 4.30 P.M., 99° 2'; 8 P.M., 98° 4'. One of the nutrient enemata brought away a little blood.

28th.—Patient is weaker, lies with her knees drawn up, and gives an occasional whining cry; abdomen not tender, a little distended about umbilicus, tympanitic in middle line from xiphoid cartilage to pubes, moderately dull to right of rectus, and dull on the left side from outer border of rectus quite into flank. No tumour can be felt in abdomen, but in right lumbar region a soft mass is felt which gives way under the finger. No fæces, flatus, or blood had passed per anum. One grain of calomel was given at 5 A.M. Vomiting of muddy fluid continued at short intervals all through the day. A hypodermic injection of one-twelfth of a grain of morphia was given at 9 P.M., and repeated twice during the night. Temperature, 11 A.M., 97°; pulse 120, small, weak.

29th.—Patient much weaker, and more exhausted and depressed. Vomiting of mucus and bile still continues. No fæces or flatus or blood from the bowel. Three grains of calomel which were given were vomited at once, and also when tried two hours afterwards. The hypodermic morphia injection was repeated. An enema, containing half an ounce of castor oil and half an ounce of turpentine, was given. It returned, tinged with fæcal matter, and brought away a few small scybala; no blood. Brandy was given every hour, and small quantities of beef-tea at short intervals.

30th.—Dr. Ringer met Mr. Hill in consultation. On examination per rectum they felt a soft round mass pressing on part of rectum. Patient much weaker; vomiting continues, and is again fæcal in character. It was decided to perform gastrotomy.

*Operation.*—Patient was put under the influence of gas and ether at 2.30 P.M., and Mr. Hill made an incision two and a half inches long in the middle line, extending half way up to the umbilicus. He dissected down to the peritoneum, in which he made a small opening and passed in his finger, but failed to find any constriction; he then enlarged the wound upwards for about an inch. The soft mass previously discovered per rectum proved to be the empty coils of small intestine which had sunk into the pelvis. Dilated intestine was found above, and followed to the umbilicus, where a constricting band was felt over a piece of intestine lying just above the umbilicus. This was brought into view, when it was found to be rather loosely constricting the bowel, but sufficiently to form a distinct furrow across the gut. The band was divided with scissors, and the gut returned into the abdomen. No blood passed into the peritoneal cavity; two small arteries were ligatured in the abdominal wall. The wound was brought together with carbollised silk sutures, and dressed with dry lint and cotton wool. The child slept for a little while after the operation, but then became very restless, screaming out; had a hot skin and flushed face; vomited dark, very offensive fluid several times, and gradually sank and died five hours after the operation.

*Autopsy, twenty-one hours after death.*—Rigor mortis well marked, emaciation extreme, no distension or retraction of abdomen. No recent peritonitis. Omentum greyish-yellow, congested; old adhesions to abdominal wall. A coil of deep greyish-black shiny intestine was seen to right of middle line about eight inches long, and on lifting

it up was seen to be tightly constricted by a firm fibrous band, which was evidently mesentery, through which the coil had slipped. About six inches above this piece there was a distinct furrow round the dilated intestine, where there were a few flakes of lymph adhering, and a short band with free end, evidently the remainder of the constriction found and divided during the operation. The hernia was about six feet below duodenum. The intestine above the constriction was dilated, moderately congested, smooth; below the hernia contracted and empty, somewhat fastened together by fibrous bands. This and the sigmoid flexure were in the pelvis. All the mesenteric glands were enlarged, some of them were cretaceous. The whole upper surface of liver adherent to diaphragm by old white adhesions; gall-bladder full of black bile. Upper and anterior part of spleen adherent to diaphragm. Lungs congested, no fibrous or calcareous nodules. The base of the right lung generally firmly adherent to the diaphragm; numerous tough adhesions of the right lung to the thorax. The viscera otherwise healthy.

*Remarks.*—This case is an interesting contribution to our knowledge of intestinal obstruction. The absence of signs strongly indicative of internal strangulation occasioned delay in performing gastrotomy, by which operation alone, the sequel proved, any chance of recovery remained. The diagnosis lay between internal stragulation and obstruction by impaction. Intussusception was negatived by the absence of tumour, the absence of frequent attempts at defecation, and by the non-evacuation of blood per anum during the whole time the patient was in hospital, though it was reported that some had passed before her admission. The comparative mildness of the symptoms for the first three days of the patient's stay in hospital, before which the obstruction had already lasted two days, the slow advent of pain and sickness, coming on immediately after an evacuation of the bowels, not immediately after the protrusion through the mesentery of one large knuckle of intestine, and the constriction of another by a cross band of fibres, suggested the probability that the obstruction was due to impaction, and that the severe exertion shortly before the occurrence of the symptoms was merely a coincidence. The possible existence of a strain or rupture and the absence of tumour were the main evidence in favor of strangulation.

In his clinical remarks on the case, Mr. Hill reminded his auditors of a case which had been in hospital previously, where a young man was suddenly seized with violent pain in the bowels and constant vomiting while performing gymnastic exercises. In this case the vomiting changed in two days from bilious to stercoraceous, and continued copious and frequent for eleven days, until spontaneous diarrhoea set in and restored the patient to health. He mentioned also a case which he had recently seen with Dr. Cornelius, of Canabury. This was also a young man, who, apparently quite well until the 7th of January, was seized, when getting out of bed, with copious and constant vomiting, with violent dragging pains on the left side of the umbilicus. In spite of assiduous treatment, the vomiting continued every two or three hours, and changed from bilious to stercoraceous. No improvement ensued, and on the 13th of January Mr. Hill was summoned. The patient then had great anxiety of countenance and lay



curled on his left side. At the umbilicus there was severe pain and considerable tenderness, the belly was distended and tympanitic throughout, no tumour felt anywhere, and the anus was empty. Nothing whatever had passed the anus since a clyster which had been administered on the 9th January. Vomiting every half-hour, or thereabouts, of fetid stercoraceous matter; tongue small and not dry; thirst. Opium was given every three hours, and hot poultices laid over the belly. Vomiting then ceased for twenty-three hours. It then recurred, but of bilious matter, not stercoraceous. The opium, combined with calomel, was continued for some days, and on the 19th the bowels were moved freely twice a day for several days, after which the patient made a rapid recovery.

In the three cases the history and the absence of positive signs were similar, yet the most severely injured patient was less violently disturbed than the others. She had less pain and less prostration; and the vomit, instead of becoming rapidly stercoraceous and continuing so, was not fecal for two days, and then only so at intervals. The prostration and weakness, which became marked before death, did not appear until the day before the operation was resorted to.

#### CASE OF INTESTINAL OBSTRUCTION; OPERATION; RECOVERY.

(Under the care of Mr. CHRISTOPHER HEATH.)

In the following case, which should be studied in conjunction with that above recorded, the desirability of cleansing the peritoneal cavity from obnoxious matters was exemplified in a striking manner. After an exploratory incision had been made through the abdominal walls, to ascertain the cause of acute permanent obstruction of the bowels, and while the pelvis was being examined with the finger, a sudden gush of pus occurred, from some uncertain source, into the peritoneal sac. The cavity was at once washed out, and the subsequent result confirmed the propriety of the practice, which, moreover, Mr. Heath's previous experience in ovariectomy seems to establish as a safe and sound one. It is curious to note that, although no band or other mechanical impediment was removed, the symptoms of intestinal obstruction almost immediately subsided after the operation.

For the notes of this case we are indebted to Mr. A. P. Gould, surgical registrar.

L. D—, aged forty-seven, laundress, was admitted Feb. 19th with the following history. She has had a left inguinal hernia for fourteen years, for which she has not worn a truss. Three weeks ago the patient slipped on some ice and strained herself. Since then the rupture has been larger, and she has had pain in it and in the back. A week ago she had an attack of diarrhoea lasting three days, but she has had complete obstruction of the bowels since the 15th, passing neither faeces nor flatus. Has vomited once.

On admission she was collapsed, complaining of pain in the belly. Tongue moist, furred. There was an easily-reducible left inguinal hernia; an indistinct tumour was felt in the left iliac fossa; nothing discovered by an examination per rectum or per vaginam. An enema of two pints of gruel was administered, followed by an equal quantity of water. Both brought away some lumps of

faeces. After this she expressed herself as relieved. Temperature: 8 P.M., 103° 2'; 9.30 P.M., 101° 6'. Pulse 100.

The next day she was in much the same state. There was the same tenderness and indistinct swelling in the left iliac fossa; no vomiting. Another enema of two pints of gruel was given with the long tube; it returned with some soft faecal matter; no other passage per rectum. Temperature, 6 P.M., 100° 4'; pulse 102. Ordered a grain of opium every four hours, and poultices to the belly.

Feb. 21st.—Temperature 100° 2'; pulse 96. Nothing passed per rectum. Was sick in the early morning—curdled milk; and again at 1 P.M.—bilious fluid, not stercoraceous; belly tympanitic, tender at lower part; no tumour detected. Mr. Erichsen saw the case with Mr. Heath, and it was decided to make an exploratory incision into the abdomen. At 8 P.M., the patient being under the influence of gas and ether, Mr. Heath made an incision four inches in length on the left side, parallel to Poupart's ligament, one inch above it, with its inner extremity over the external abdominal ring. The external and internal oblique muscles were divided on a director; the transversalis muscle was torn through with the finger; the transversalis fascia was divided on a director, and the peritoneum opened. Mr. Heath found the intestine bound down by some adhesions, but could find no strangulation anywhere. While examining the pelvis with his finger, there was a sudden gush of a large quantity of perfectly sweet, laudable pus, which escaped into the peritoneum, and out at the wound, from somewhere near the back of the sacrum. Its exact source was uncertain. The peritoneal cavity was then washed out with warm water, the wound closed with silver sutures, a pad of dry lint applied, and the patient carried back to bed. Ordered fifteen drops of tincture of opium every four hours, one teaspoonful of brandy every half hour, and poultices to abdomen. The patient was sick immediately after the operation, and was in a very collapsed condition all the night. She passed flatus several times.

The next morning she was better, tongue moist, fur thinner. Temperature 102°; pulse 114; belly very tender on left side. Opium given every six hours; brandy reduced to three ounces in twenty-four hours. She continued to pass flatus frequently through the day; no motion; at night she vomited a small quantity of bilious fluid.

23rd.—Dressings removed; wound looks well; edges in perfect apposition; no pus; similar dressings reapplied. In the afternoon she was very low, livid, apparently dying. The brandy was increased to six ounces; at her own request some beer was given, and a turpentine stupe was applied to chest. By this she was considerably relieved, and next day her lividity was less, dyspnoea less, pulse stronger, though still very small, 110; temperature 100°; tongue moist. Ordered a mixture containing opium, carbonate of ammonia, and squills.

On Feb. 25th she passed three small soft motions; the tenderness of abdomen was less, and limited to just around the wound, which was united except a small part at the upper end of it. Sonorous—but no bubbling—râles heard over front of chest. Temperature 100°; pulse 108. Opium stopped. Takes Brand's jelly and whites of four eggs. During the night she passed nine very small

faecal motions, no pus in them. The sutures were removed from the wound, the discharge from which was very offensive; poultices applied. Fifteen drops of spirit of nitrous ether were added to the above cough mixture. The diarrhoea continued to be troublesome for several days, and was only partially checked by chalk and by compound catechu mixtures. The wound suppurated freely at the upper part, and on the 29th a soft slough was removed from the site of the upper stitch. On the 28th the patient ate some custard pudding, and on the 29th she was put on fish; she was then free from all abdominal tenderness. From this time she slowly but steadily improved. The wound granulated up at the upper part; the bowels became regular after the 4th of March; the dyspnoea diminished; and the expectoration, which at first was very tenacious, became more diffuent and aerated. On March 7th she was sick in the early morning, but had no other bad symptoms. She was ordered a mixture containing nitro-hydrochloric acid and decoction of cinchona. The patient was allowed to get up for the first time on March 14th, and on the 29th she left the hospital with the wound healed, her symptoms all relieved, bowels regular, but still feeling rather weak.

### WEST RIDING LUNATIC ASYLUM.

CASE OF EPILEPSY OF TRAUMATIC ORIGIN; HÆMORRHAGE FROM VESSELS AT THE BASE OF THE BRAIN.

(Under the care of Dr. MAJOR.)

THE following record, for which we are indebted to Mr. Robert Lawson, M.B., is replete with interest, whether it be regarded from a physiological and pathological or from a purely clinical point of view. The notes are extended, but unavoidably so; a more or less complete history being essential to a right comprehension of the various abnormal manifestations.

B. W— was admitted on May 23rd, 1873. His symptoms were those of epilepsy, with excitement and dementia. His relatives stated that till he was six years old he was a bright intelligent boy. When at that age, however, he was knocked down during a Royal procession through Leeds, and his head was run over by a carriage-wheel. From that time he began to have fits, which increased gradually in number and severity till he fell into a state of dementia. He was sent to a London hospital, and while there had necrosis of the bones of the skull. His mother stated that one or two pieces of bone had been removed from the right side of his head. There was no family history of epilepsy or of any allied disease. When admitted, the patient was very stupid and demented. He was listless, drowsy, and reticent. To some extent he understood what was said to him, but did not know his age, and to most questions answered "I'm sure I don't know." His speech was low and drawling. He was wet and dirty, and had to be fed and dressed. Physically he was fairly well, and there was no derangement of any of the main systems of organs. The pupils were normal, but the cornea of the right side was opaque. The upper lid of the same eye was drawn upwards by a cicatrix which involved the

whole of the right temple, and in the postero-parietal region there was a small depression in the bone, surrounded by small bony projections.

The following is an abstract of the record of the case:—

May 28th, 1873.—The patient had a severe fit yesterday, and has had many less severe ones, especially at night.

June 6th.—Is having four or five fits a day, and a great deal of noisy excitement and muscular agitation. Ordered twenty grains of bromide of potassium twice a day.

16th.—No change. Bromide stopped, and inhalations of nitrate of amyl ordered every hour.

26th.—The bromide was resumed a week ago, and he has improved very much. He has not had even a slight fit for three or four days. He is less dirty, and can wash and feed himself. The bromide is to be increased to thirty grains three times a day.

Sept. 18th.—He has not had any fits for a long time. He is gaining flesh, and works in the shoemaker's shop.

Oct. 15th.—Fits much less severe and less frequent. He has had only one during the past month. Since the fits became reduced in number he has gained flesh and strength, but has been liable to paroxysms of excitement, in which he fights fiercely, and yesterday he had a severe and prolonged struggle with another patient. This excitement made it necessary to withdraw him from the workshop.

During the year 1874 he continued to be aggressive and quarrelsome, and up to January of the present year his symptoms consisted of frequent fits, and repeated attacks of excitement. During the whole of this period he had an offensive discharge from the left ear, and in September, 1875, had a small abscess behind that ear, but no bone was emitted from it.

Jan. 25th, 1876.—He has had a very serious attack of hæmorrhage from the mouth, nose, and left ear. The blood was pure arterial and came in so plentiful a stream that about a quart was parted with in five minutes.

29th.—He has had another smart attack of hæmorrhage in which he lost about a pint and a half of blood. In these attacks the attendant had orders to hold his hands over his head whenever the bleeding commenced. This treatment was generally followed up by the hypodermic injection of five to ten grains of ergotine on the arrival of the medical officer. Though both of these measures were apparently useful, yet the bleeding was generally so suddenly arrested that it is much more probable that it stopped spontaneously. Considering the known element of the case and the rapidity and alarming extent of the hæmorrhage, it was now diagnosed that caries at the base of the brain leading to the ulceration of some large vessel or vessels was the cause of the recurrent attacks. Iodide of potassium and cod-liver oil were ordered. Before the bleedings came on he was seen to be very pale and to have lost strength.

30th.—Has had a severe bleeding again. His pulse is very weak and he is exceedingly anæmic.

Feb. 4th.—No recurrence since last report. His pulse is stronger and he is on the whole much better.

5th.—Lost about a pint of blood.

12th.—Yesterday he had another severe attack of hæmorrhage.

16th.—Lost about a quart of blood. The hæmorrhage was seen by the medical officer. The blood came from both nostrils and from the left ear. From each nostril there was a constant stream of about one-sixteenth of an inch in thickness, and that from the ear was a mere trickling. It was presumed that the main current of blood ran along the course of the olfactory grooves and through the broken-down cribriform lamellæ. The structure of the left ear had now been damaged, and the patient was very deaf.

21st.—He had a severe fit to-day.

26th.—He has had a recurrence of the hæmorrhage.

March 4th.—Has had no return of bleeding. He is much better, and is to get up.

7th.—He has had a slight attack of bleeding this morning.

14th.—He had a severe fit yesterday, but no hæmorrhage. Between the bouts of bleeding he improves in physical condition amazingly. He is querulous and stupid, and sometimes refuses his extra diet, but is much attached to several of the excited occupants of the same ward, who form a body guard around him to protect his delicacies from the encroachments of predatory epileptics.

April 20th.—He has had several attacks of sickness, which caused bouts of hæmorrhage. It was frequently observed that epileptic fits never brought on, nor were associated with, hæmorrhage, but that sickness almost invariably caused bleeding. This observation suggested two things: first, that the lesion which caused the hæmorrhage was not identical with that which produced the epilepsy; and, secondly, that the condition of the circulation of the brain during epilepsy was, in this instance at least, widely different from that present in vomiting.

On the evening of April 20th, the patient, after a respite longer than usual, had a frightful outburst of bleeding from the mouth, nostrils, and left ear. When the medical officer arrived, B. W.— was found to be having slight general convulsions, and immediately afterwards he had two or three stertorous respirations, after which life appeared to be gone. He was turned on to his side, and his mouth was cleared. Artificial respiration was practised. At the same time a stimulant injection was administered. The respiration was re-established, but only for a very short time. Passive movements of the respiratory muscles were maintained for half an hour, but resuscitation was impossible.

It may be added that in this case the epileptic convulsions were so general that no exact localisation of the lesion producing the epilepsy could be suggested. There was no paralysis.

*Post-mortem examination.*—The autopsy was held forty hours after death. The body was fairly nourished, but its surface very pale and blanched. Rigor mortis was present, but there was no hypostatic congestion. On the right side of the head, in the region of the frontal eminence, and extending backwards as far as the outer end of the superior curved line of the occiput, there was a white puckered scar about an inch in breadth. The upper eyelid of the right eye was also involved in and drawn up by the cicatrix. On removing the scalp there was found to be a depression in the skull, commencing at the right parietal eminence, extending downwards and backwards for about an inch and a half, and gradually

deepening till at its termination its floor consisted of fibrous tissue filling up a breach in both plates of the bone, which was circular in form and about as big as a threepenny piece. In front of this depression there was slight roughening and elevation of the external plate. In this region, and over the cavity, the periosteum was thickened and adherent. On removing the skull-cap it was found that at the site of the small opening in the cranial wall the subjacent membranes adhered to the bone, to each other, and to the brain, and that in the act of removal a portion of dirty softened grey matter was left adherent to the inner surface of the calvaria. There was only slight opacity of the membranes and little or no wasting of the convolutions except in the neighborhood of the opening in the skull. At this spot there was brown discoloration, softening and wasting of the cortical substance extending over the surface for about an inch in length and half an inch in breadth, and affecting the angular gyrus on the right side. On the orbital lobule on both sides there were lines of brown staining running parallel to the olfactory sulci, and apparently resulting from previous pressure of blood. On the first temporo-sphenoidal gyrus of the right side there was a brown film evidently formed by altered blood, and about the middle of the left orbital lobule there was a small pit with brown walls, also apparently resulting from the pressure of blood. The whole brain-substance was blanched and anæmic, and there was no trace of internal clot. The degeneration of the grey matter corresponding to the breach in the cranial wall was found to be continuous with a distinct cavity in the white matter, the walls of which were of a brown color. On examining the base of the skull it was found that the upper and inner aspect of the petrous portion of the temporal bone on both sides presented a ragged, rough, unsymmetrical surface, being in some places formed into sharp, irregular ridges, about a quarter of an inch in height. The upper aspect of the petrous portion on both sides was very rough, and immediately posterior to the carotid canal on the right side there was a deep depression, the walls of which were anteriorly elevated into a sharp ridge overhanging the upper end of the canal. The canal itself was partially obstructed by rough projections from its bony walls. On the left side the roughness and brown discoloration of bone extended much farther back, and the upper end of the carotid canal was almost occluded by a cribriform projection of bone, which was rough and of a deep brown color. With pressure the canal admitted a round instrument about one-eighth of an inch in diameter. There was brown staining of the dura mater over the petrous portion of both temporal bones. The other organs were healthy.

*Observations.*—There were two main elements in this case—(a) epilepsy, and (b) hæmorrhage. That the epilepsy was due to injury of bone and membranes over the angular gyrus of the right side, and probably to damage of the brain-matter itself, admits of little doubt. How far the appearances of inflammation and degeneration of bone around the carotid canals were traceable to the primary injury it is almost impossible to determine. With regard to the epilepsy, one or two passing observations are admissible. First, when the patient was brought to the West Riding Asylum the fits had become dependent on too wide a range of causes to admit of exact localisation of the original

lesion. Secondly, the development of excitement after partial suppression of convulsions by large doses of bromide of potassium is an instance of what is frequently observed in this asylum. Repeatedly patients who appear to be almost if not altogether cured of their fits by the use of that drug, break out into unexpected attacks of destructive or homicidal excitement, and afford striking evidence of the correlation of mental with motor irritability. This observation has acquired strong confirmation from the interesting investigations of Dr. Bevan Lewis, of this institution, who, in papers published during the present year establishes the belief that this correlation exists not only between convulsions and excitement, but also between convulsions and the evolution of heat. With regard to the hæmorrhage, the appearances presented after death went to confirm the opinion formed during life, that the bleeding resulted from rupture of some large vessel or vessels at the base of the brain. The condition of the bone around the carotid canals renders it probable that at their upper part the internal carotids were very much reduced in calibre, and also suggests that friction of the walls of the carotids, or more likely of some of their large branches, against the roughened bone may have produced recurrent ruptures and consequent hæmorrhages. The diminished arterial pressure following on great loss of blood must have led to a comparative cessation of the mechanical rubbing of vessels against the roughened osseous surfaces. To this cause may be traced the total freedom from hæmorrhage between the severe outbursts, while the recurrence of the latter as soon as the patient's physical condition improved and his bloodvessels became fuller, is also explicable by the increasing and consequent tendency to laceration of the vascular walls by their pulsatile grating against denuded and roughened bone.

## MIDDLESEX HOSPITAL.

### CASE OF CEREBRO-SPINAL MENINGITIS; DEATH.

(Under the care of Dr. HENRY THOMPSON.)

THE following case, for the notes of which we are indebted to Dr. Humphreys, medical registrar, differs in many important respects from the Oxford cases which were recorded last month. Indeed, the eye symptoms in this case seemed to indicate some morbid change at or near the right crus cerebri. We hope soon to be able to discuss in more detail the important affection known as cerebro-spinal meningitis, referring especially to the cases reported in this journal.

John B—, aged fifty-three, admitted April 27th, 1876, into Cambridge ward. His previous health had been good. Present attack began five days previously with violent pains over the bottom of the back and right side. The night before admission he complained of pains in his head. About 2 P.M. on the day of admission he had a fit, and became unconscious while at his work. He remained unconscious until his admission in the evening. For some days he had complained of giddiness. He passed water, and his bowels had not been confined.

On admission he was unconscious, very restless, struggled when touched, could not lie quiet,

moaned slightly. Ptosis of right eyelid, but this was not constant, for he sometimes opened the eye. External strabismus of right eye. Right pupil large, and insensible to light. No apparent difference in power on the two sides of body. Twelve ounces of urine withdrawn by catheter, of dark color, acid reaction, specific gravity 1025, and containing an eighth of albumen. Ordered thirty grains of compound jalap powder, with an ounce and a half of compound senna mixture. To have a hot-air bath. 9 P.M.—Pulse 100; temperature 103°. Was quieter after the bath. Ground his teeth. Was still unconscious. Complete and constant ptosis of right eyelid. Right pupil large and insensible to light. External strabismus of right eye. Optic discs natural.

April 28th.—Passed a very restless night, trying to get out of bed. Grinds his teeth at times; answers questions coherently; says he has no pain; ptosis and external strabismus on right side as last observation; no inward, upward or downward movements of right eye; right pupil large, left normal; no appearance of facial paralysis; no rigidity or paralysis of limbs. Urine: sp. gr. 1030, acid; albumen one-sixth. Bowels opened once slightly. Ordered twenty-five grains of chloral, and to have four grains of iodide of potassium and ten grains of the bromide every six hours.—9 P.M.: Pulse 100; temperature 102.5°. Still restless and writhing about in bed.

29th.—5 A.M.: Became unconscious; right side of face and body paralysed; left pupil is now dilated and insensible; ptosis and external strabismus on right side, as before; urine passed in bed.—10 A.M.: Pulse 160; respiration 50.—1 P.M.: Died.

*Autopsy, forty-nine hours after death (by Dr. Coupland).—*Body well nourished and muscular. Veins and sinuses and dura mater distended with fluid blood. On reflecting dura mater, the anterior third of the cerebral lobes was seen to be entirely covered by a quantity of opaque, greenish-yellow lymph, in which here and there a large vessel was visible. The lymph was situated beneath the arachnoid, and dipped into and filled the sulci between the convolutions. It diminished in quantity from before backwards. There was slight adhesion between the two hemispheres, and upon their inner aspects there was a similar exudation to that upon the convexities. Here, as there, it was most abundant on the frontal lobes. A small quantity of exudation was found upon the upper surface of the middle lobe of the cerebellum. All the bloodvessels of the pia mater were congested. On the under surface of the frontal lobes there was nearly as much exudation as upon the convexity, and around the nerves and other parts at base of brain there was shreddy lymph and some fluid effusion. There was no perceptible difference in the amount of exudation on the two sides. A small quantity of lymph occurred on the inferior surface of pons and medulla.—Interior of Brain: Grey matter did not appear to be unduly congested. No softening found. Walls and roof of lateral ventricle studded with points of capillary hæmorrhage, as also the fornix. Choroid plexus thinly covered with lymph. A considerable quantity of ventricular effusion on each side.—Spinal cord: Dura mater opened along its posterior aspect. The greater part of this surface of spinal cord was concealed beneath a quantity of greenish lymph contained within the pia mater beneath the arachnoid. It was not uniform in its distribution,

but occurred almost continuously from the middle of the cervical enlargement to the upper part of the lumbar enlargement. The layer of lymph was thickest opposite the upper dorsal region and again in the middle third of the dorsal region, whilst in the lower third it covered only the left half of the cord. There was also apparently much exudation around the roots of the spinal nerves, and some in front of the cord, but less than on its posterior aspect. The vessels of the spinal pia mater, where not wholly concealed by the exudation, were seen to be much engorged.—Thorax: Lungs engorged in lower lobes.—Heart: Right cavities engorged, left nearly empty; mitral and aortic valves opaque, nodules of atheroma in aorta.—Liver healthy-looking; weight 63 oz.—Spleen: Weight 6½ oz.; capsule presented numerous white patches of small size, each surrounded by a zone of vascular congestion. Consistence firm; color dark red.—Right kidney weight 6 oz.; capsule adherent, leaving on removal a somewhat granular surface. A few cysts on the upper layers of the cortex. There was but slight wasting of the cortex, but its margin was crenated. The whole organ was tough and much congested.—Left kidney similar to right.

## BIRMINGHAM GENERAL HOSPITAL.

### CEREBRO-SPINAL FEVER; RECOVERY.

(Under the care of Dr. FOSTER.)

It is interesting to note that in the subjoined case an affection of sight was among the most marked symptoms; in the Middlesex case the ocular muscles were disordered.

For the following notes we are indebted to Mr. J. Henry Palmer, resident clinical assistant.

Arthur S—, aged eighteen, a jeweller, was admitted on March 21st, with the following history:—On the preceding Saturday—the 18th—though rising in the morning feeling quite as well as usual, he felt during the latter part of the day, low, depressed, and tired, so that he stopped at home, and went to bed early. His appetite was good at each meal that day. He slept well that night, until five o'clock on Sunday morning, when he awoke, feeling very thirsty, and stiff about the neck and back. At 5.30 A.M. he had a severe shivering fit, which lasted half an hour, and then for the first time he complained of severe pain in his head. He was extremely restless, getting out of bed every minute, and frequently running down stairs, staggering and giddy as he was. The pain in the head was sharp and shooting, more in the back than in the front. The pain in the back was chiefly in the cervical and lumbar regions. His sense of sight was quickly affected. Though quite light, he could scarcely see across the room; the light gave him pain, and he saw everything double. His hearing was unaffected; he was partially delirious. The pain in the head and loins, the stiffness of neck and restlessness, got worse. On the Sunday and Monday his bowels were not opened, but on Tuesday morning he had a sharp attack of diarrhoea. That evening (the 21st) he was admitted in very much the same condition as that described, a diagnosis of cerebro-spinal fever at once being made. He was ordered a hypodermic injection

of a quarter of a grain of morphia that night. Temperature 104.4° F.; pulse 102.

March 22nd.—The patient has passed a very restless night, frequently attempting to leave his bed, moaning a good deal, and complaining much of pain in his head and loins. The head is drawn slightly backwards, and the neck is stiff; all attempts to move it cause the most excruciating pain. The pain in the loins is not so violent as this. No pain in the limbs, but at the same time there is marked hyperæsthesia of the thighs and legs. The sight is still very dim, but there is no photophobia. The sense of hearing is unaffected. He is perfectly conscious, and answers questions put to him quite rationally. A crop of herpes has begun to make its appearance on the lips, chin, and immediate neighborhood, arranged somewhat symmetrically on the two sides. The tongue is white and furred. Sickness has ceased. Bowels have not been open since admission. Nothing abnormal is detected in heart and lungs. The urine has the following characters: specific gravity 1030; acid; copious deposit of urates; contains an obvious trace of albumen. Temperature 101.5°; pulse 84; respiration 24. Ordered six leeches behind each ear, and the morphia injection night and morning with the following prescription: five grains of iodide of potassium, ten grains of bromide, and one drachm of the solution of acetate of ammonia in water, three times a day.—9 P.M.: Much better this evening in every way. The pain is scarcely complained of, but the cervical stiffness and retraction remain. Temperature 101°; pulse 68; respiration 24.

23rd.—Not nearly so restless last night as before, but still he has had but little sleep; otherwise he is much improved. There is now no retraction of the neck, but some stiffness; no pain when lying perfectly quiet, but he cries out on any attempt to bend his neck; hyperæsthesia of the legs is much reduced; the tongue is cleaner; urine contains no albumen. Ice is ordered to the spine and back of head and neck, also to be sucked; the herpetic eruption before mentioned is at its height, but the area affected has not extended.

26th.—Bowels not having been opened since admission, a saline aperient was ordered, after which they were freely relieved. Since last note he has much improved. He has neither pain nor tenderness; his sight is once more normal, and the herpes is fast disappearing. He has passed a very good night, sleeping soundly after his evening injection; the morning injection being discontinued. Temperature 99° both morning and evening.

30th.—Is partially convalescent. Ordered iodide and bromide of potassium as before, with infusion of gentian, three times a day. Has much emaciated since the commencement of his illness.

April 7th.—Is up and about and fairly well, though weak. Ordered the following prescription:—One grain of sulphate of quinine, ten drops of tincture of digitalis, and ten drops of dilute sulphuric acid in water, three times a day.

21st.—Discharged.

*Clinical remarks.*—Dr. Foster, in calling the attention of the students to this case, referred to a number of similar cases which he had seen during the winter in the Midland district. The disease had, indeed, been epidemic, and the earlier cases had been very fatal. The illness had generally begun suddenly, as in the present instance, with

shivering, pain in the head and spine, giddiness, vomiting, great restlessness and excitement, with stiffness of the neck and spinal column. In the more severe cases the retraction of the neck was an early symptom, and there was well-marked delirium. Shooting pains in the limbs and hyperæsthesia of the general surface were commonly observed. In most cases the fever was rapidly developed, rising to between 102° and 103° F. within a few hours of the commencement of the illness, in two cases observed from the onset. The fever was very irregular, scarcely any two temperature charts being alike, and in some a variation of two or three degrees occurred in the course of a few hours. There was also frequently a want of the usual relations between temperature, pulse, and respiration rates. In addition to the characteristic symptoms of sudden onset, early high temperature, intense headache, sickness, and stiffness of the neck and spine, there were the extreme restlessness and agitation of the patients. This last symptom, together with the general cutaneous hyperæsthesia, had led, in more than one instance in Dr. Foster's experience, to diagnosis of hysteria. This was a grave mistake, and the possibility of the error deserved to be borne in mind. The eruption of herpes on the lips and face had been common; red rashes and petechiæ had also been observed. Disorders of sight, such as those observed in the present case, were not unusual, and in one case amounted to absolute blindness lasting for some days. Deafness also occurred in some cases, and in one dysphagia so complete as to necessitate the use of nutritive enemata for a time.

In referring to treatment Dr. Foster pointed out that in some of the graver cases all treatment seemed unavailing; he had, however, seen most benefit derived from local depletion and the use of morphia hypodermically. In this form morphia, continued with depletion, was most valuable in relieving the pain and subduing the restlessness. Opium internally had been used with advantage in other cases, and seemed more valuable than chloral or the bromides.

Of eight fatal cases that Dr. Foster had seen, only one occurred in the hospital—viz., a child aged four years. In this case the pia mater and arachnoid were thickened and matted together by firm strings of lymph, the brain was injected, the ventricles distended with muddy fluid, and their walls, much injected, were coated with a half-mucous half-fibrillated material.

### SEAMEN'S HOSPITAL, GREENWICH.

#### CASE OF ACUTE RHEUMATISM TREATED BY SALICIN.

(Under the care of Dr. RALFE.)

THE almost specific power which salicin seems to possess of arresting the course of certain cases of acute rheumatism with high temperature is well exemplified in the following case, which was recently treated at this hospital:—

James A., aged twenty-two, was admitted May 16th, on the second day of his illness, with all the symptoms of rheumatic fever. He was quite helpless from the severity of the pain in the large joints, drenched with acid perspiration; the chest and abdomen covered with sudamina; the

tongue thickly coated with white fur. Pulse 120, full and bounding; temperature 104°. No cardiac complication. The patient was at once put on salicin, ten grains every second hour; to have half a grain of the acetate of morphia at night; milk; diet. On the evening of admission, after six doses of salicin, the temperature had fallen to 102·8°.

May 17th.—Pulse 104. Morning temperature 102·4°; evening 102·6°. Pain in elbows and wrists very severe.

18th.—Pain much relieved. Morning temperature 101·4°; evening 101·8; pulse 98.

19th.—Patient expresses himself as quite relieved. Perspiration much less; tongue cleaning. Morning temperature 100·2°; evening 101°.

20th.—Improvement continues. Patient says he feels quite well, his pain quite gone, and he has asked to be allowed to get up. Morning temperature 99·2°; evening 99·8°; pulse 86.

21st.—Patient quite convalescent. Temperature normal.

22nd.—Allowed up. Temperature normal.

23rd.—Patient very anxious to be discharged, as he says he feels "perfectly well."

25th.—Patient discharged, convalescent.

*Remarks.*—This case well illustrates the marvellous power which salicin seems to exert in some cases of rheumatic fever. On admission the case threatened to be long and severe, the temperature was high, and all the symptoms acute, yet in four days the patient was practically convalescent. The rapidity of the cure will contrast favorably with the most favorable recorded cases under other modes of treatment, and from what we know of the history of rheumatic fever, the result can only be attributed to the salicin.

## Editorial.

### THE HISTOLOGY OF THE EVOLUTION OF THE MAMMA.

THE subject of the mode of origin and development of tumours is one which has long occupied the attention of pathologists, the majority of whom have, however, been content to accept the clearly expounded doctrines of Virchow, who attributed to the "connective-tissue cell" properties of heteroplastic change, so that modifications in it alone were at the root of all tumour-formation. Little by little, however, the famous cellular pathology of Virchow has lost much of the restricted scope which its author gave it, and the derivation of several, if not most, malignant growths from epithelial elements is admitted by many; while a few, as Dr. Creighton, would make the epithelial cell to be the progenitor of all tumours, whether sarcomatous or carcinomatous. It will be remembered that last year Dr. Creighton published a preliminary investigation into the etiology of cancer in the valuable scientific reports issued by the Medical Officer of the Privy Council.

In that report he dealt chiefly with secondary malignant tumours, and directed attention to the part played by vacuolation of the glandular epithelium of the organ secondarily affected in the formation of new tumour-cells. Vacuolation—in other words, “endogenous cell-formation”—was, he maintained, not only the process by which, in secreting organs, the product of secretion was formed from the epithelial cells of the gland, but it was also the initial stage of the morbid change undergone by the same organ when it became the starting-point of new growth. His paper concluded with the announcement that he was undertaking the investigation of the mammary gland, and the relations of its cycle of periodical changes to the formation of tumours within it. The lately-issued volume of Mr. Simon's Reports contains the results of Dr. Creighton's research in a paper perfectly exhaustive of the subject, and valuable as a contribution to the physiology of the mammary gland equally with its pathology. Aiming at a demonstration that the normal physiological changes of the mamma are represented in the pathological changes, he enters into full detail with regard to the former, contributing much new matter on the subject. It will be necessary to briefly summarise the results of this anatomical research before passing to the author's investigations as to the histogenesis of tumours.

Dr. Creighton's investigations were pursued at the Brown Institution, and he employed the mammae of various animals in different stages of activity, his aim being to note the changes that take place in the gland in its involution from the state of activity in which it exists at lactation to its resting state; and also to note the changes which the gland undergoes during its evolution from the state of apparent functional rest to that of full functional activity. He has submitted to examination glands in all stages of these two conditions, and has found a striking parallelism in the processes which lead up to the full state of secretory activity, and those which lead down from that to the inert condition of complete involution. The involutional changes are somewhat as follows: on the cessation of lactation the fully-developed mamma is found to be composed of well-formed acini lined by a well-defined polyhedral epithelium, each cell containing a round nucleus varying in size in proportion to the surrounding protoplasm. At the end of involution, however, the gland tissue is shrunken, the interlobular tissue is largely occupied by fat, and, instead of well-defined cells, the acini are lined by, or rather contain, only round or irregularly oval nuclear bodies, while each acinus is reduced to about one-fourth of the size of an acinus during lactation. These changes, depending upon diminished blood-supply, show how the formative processes are reduced to a minimum in proportion as the functional activity of the

gland decreases, and the intermediate stages between the two extremes of full secreting activity and full involution illustrate this fact in a striking manner. If the breast be examined at the middle of the period of involution a large number of the epithelial cells will be found to be in a perfect state of vacuolation—i.e., that their contents are in great part replaced by a clear fluid material, the nucleus of the cell invested in more or less of the original granular protoplasm being displaced to the periphery. This vacuolation of the cells is, as Dr. Creighton points out, the same process in kind that takes place in the gland when it is in full force of functional activity; it is however, in the degree in which it takes place and in the deterioration of the products of the vacuolated cells that the essential difference between the two conditions lies. During lactation the vacuolation of the glandular epithelium results in the formation of the colostrum corpuscle, which is utilised in the milk; but when the products of vacuolation are no longer required to be used up as milk, they are found simply as cellular waste, to be taken up by the lymphatics. This cellular waste in the involuted mamma is composed of two varieties of cells—viz., small round cells which accumulate within and infiltrate the tissue between the acini, and large granular cells of a bright-yellow color, perfectly characteristic, which also are massed within and around the acini. Thus, even when it is no longer called upon to act, there is a constant renewal of the epithelium of the mammary gland, and a transformation of this into cells, unlike the parent epithelial cell, and also unlike the colostrum corpuscle, but derived from the former by an endogenous process similar to that which gives rise to the latter. They are, however, waste products, at least so far as the milk-secreting function is concerned. Yet their presence seems to show that a formative stimulus is still acting upon the gland.

Precisely similar changes, distributed in reverse order, take place in the gland during its evolution into the state of full secreting activity, as obtains at the end of pregnancy. During the earlier periods of pregnancy, the mammary gland being in what may be styled the first stage of evolution, there is but little apparent difference between it and the involuted gland. The epithelium may be as small and nuclear as it is in the resting state, but the number of large yellow cells is very great, both within the acini and in the submucous tissue. In the second stage of evolution the cells lining the acini, although still of small size, are yet arranged in a more orderly manner, and now no longer are the large waste cells found, the bright yellow pigmentation of which forms so striking an object in specimens obtained from the involuted gland. On the other hand, a breast at this stage shows the interacinous tissue to be largely occupied by a



growth of spindle-cells. By a strict follower of Virchow such a formation of spindle-cells would be regarded simply as evidence of increased overgrowth of the connective tissue of the gland proceeding in harmony with its functional development. Dr. Creighton, however, contends against the view that these spindle-cells arise from connective-tissue corpuscles, but holds that they belong to the same category as the large yellow cells which were distinctly epithelial products. Like these cells, he believes that the spindle-cells are the results of endogenous cell-formation of the glandular epithelium. They are as much "waste products" as the yellow cell so often mentioned, and have nothing in common with the connective tissue beyond their situation between its meshes. This contention for an epithelial mode of origin for spindle-cells is at the root of the position assumed by Dr. Creighton with regard to the development of morbid growths, and is one which has lately received confirmation at other hands. In the third and final stage of its evolution, as the mammary gland approaches its full term of development, the acini become fully formed, and the process of vacuolation is seen to be very active. The fluid contents of the vacuoles are at first composed of mucus, but later this gives way to milk, and fully-formed colostrum corpuscles are thus produced from epithelial cells, which are renewed with great rapidity.

Thus, as Dr. Creighton points out, there is an exact parallelism between the process of involution and that of evolution of the mammary gland, as regards the production of waste cells; this depending simply upon the degree of functional activity of the gland, with which the formative activity keeps pace. The characteristic pigmented cells, the last of the series of waste products which are thrown off in involution, are the first to make their appearance on the renewal of the stimulus which again calls the gland into activity; then they disappear, to give way to the production of a large number of nucleated bodies, which, crowding together in the interfascicular connective-tissue spaces, assume a spindle shape. Finally, the same process which has led to the production of these bodies shows itself in the typical vacuolation of the epithelium, resulting in a mucoid and then in a milky secretion; whilst the epithelium-cells that are not so transformed assume the shape of perfect polyhedra. Dr. Creighton enters at length upon the manner in which the cellular waste is disposed of—namely, by means of the lymphatic system—and his description includes a detailed account of the histology of lymphatic glands.

The application of these facts upon the normal changes in the mammary glands to explain the histogenesis of pathological products forms the rest of Dr. Creighton's paper. As, however, to do full justice to this will require more space than can

now be devoted to it, we shall return to this subject again, when we shall take occasion to refer to one or two other contributions to our knowledge of the subject of "pathological histogenesis" recently made in this country.

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### THE ACTION OF THE SALTS ON THE BILIARY ACIDS.

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THE frequency of cases of simple jaundice and the striking differences between them and those severe forms which occasionally present themselves to the clinical physician, make every attempt to elucidate the pathology and relations of these affections of great interest. Notwithstanding the numerous efforts that have been made in this direction, we have but little precise information on the action of *small* quantities of bile on the organism. Most observers have used large quantities, and the animals experimented on have speedily died with grave cerebral symptoms and hæmorrhages, due probably to the direct action of the bile-acids on the blood-corpuscles. Drs. Feltz and Ritter, of Nancy, have made some important researches with small quantities of the biliary salts, and have lately presented a memoir to the Académie des Sciences, containing the results of their observations. They found that by injecting into animals small doses of a mixed solution of glycocholate of taurocholate of soda in the same proportions as in normal bile, a pathological state could be induced, which lasted for five or six hours only, and was marked by bilious vomiting and diarrhoea, a slow pulse, and a slight reduction of the temperature and the frequency of the respirations. These symptoms coincide so fully with those that occur in slight jaundice that they were led to examine more closely into their production. They determined that the phenomena were entirely due to the bile-acids, that the biliary pigment had no share therein, and that cholesterine only acted mechanically by producing embolism. This is a most important observation, for it directly opposes the views of Dr. Austin Flint, Jun., who teaches that the non-excretion of this constituent of the bile causes the cerebral symptoms in severe jaundice, and it removes cholesteræmia from the category of diseases. The slowness of the pulse and the diminished arterial tension were most marked soon after the injection of the bile-acids, but persisted for some time after their elimination. As these phenomena could be ascribed to various causes, peripheral and central, it was next shown, by their occurrence after section of the vagi and sympathetics, that they could not be due to any special action on the nervous system, unless on the cardiac centres themselves. When the heart was removed from the body, and allowed to imbibe the

solution of the bile-salts, its movements speedily became irregular, and then ceased altogether; but, as ordinary muscular fibre also refused to contract in a quarter of an hour after the same solution was dropped on it, whilst if a solution of chloride of sodium of the same strength was substituted its contraction was quite vigorous and energetic after a much longer interval, the independence of any nervous influence was thus decisively proven. This special paralysing effect on muscle at once explains the slow pulse, the weak cardiac contractions, the diminution of the arterial tension, the lowering of the temperature, and the lessened number of respirations. But, in addition to this action on muscular tissue in general, and on that of the heart in particular, further experiments showed that when blood was mixed with the solution of the biliary salts its rate of flow through capillary tubes was considerably diminished. This did not happen when the solution was mixed with blood-serum, so that it obviously exercised a special action on the corpuscles, as may also be verified by microscopical observations. It is well known that this effect is so marked with concentrated solutions of bile that the corpuscles undergo disintegration, but such a conclusive establishment of the influence of even a small quantity of bile-acids in the blood is of great value. A more precise explanation of many symptoms of simple jaundice is thus afforded us, and the importance of these investigations by such competent and well-known observers will be appreciated by every pathologist and physician.

## Medical Annotations.

"Ne quid nimis."

### BILE AS A CHEMICAL REAGENT.

At a recent sitting of the Medical Academy of Rome, Dr. Ratti, *apropos* of the fact that bile, slightly acidulated, has the property of precipitating the poisonous alkaloids and glucosides, as well as albumen, attributes the fact to the tauro-cholic acid, liberated by the acids, and existing in the bile—not to all the constituents of the bile taken collectively as Professor Moriggia seemed to hold. Dr. Ratti's conclusions are these: 1. That the tauro-cholic acid may be used in aqueous or alcoholic solution in examining liquids containing alkaloids, glucosides, &c. 2. That this acid which may be had, extemporaneously, from tauro-cholate of sodium, is better as a reagent than acidulated bile, in which the gluco-cholic acid may conduce to error by its precipitation. 3. That the tauro-cholic acid may be enumerated among the general reagents of the alkaloids and glucosides, and is the best reagent for the detection of albumen. 4. That this latter property explains clearly why the

bile arrests stomachic digestion. 5. That the substances which form insoluble compounds with the albuminoids being regarded as antiseptics, the antiseptic virtue of the acidulated bile to which Professor Moriggia called attention may readily be understood. Professor Moriggia, at the conclusion of the sitting, informed the Academy that he would lay before it the result of fresh investigations.

### THE EXCITABILITY OF THE HEART.

In a recent note on the excitability of the heart, read before the Académie des Sciences, M. Marey shows that this organ, at each phase of its revolution, undergoes changes of temperature which modify its excitability. Experiments demonstrate that the excitability of the heart, like that of other muscles, augments and diminishes with variations of temperature, and his experiments also demonstrate that the excitability of the heart changes at different phases of its revolution. This leads us to ask whether the temperature of the heart does not vary at different instants of its revolution, and also whether the succession of these variations is not such that the period of cooling corresponds to the phase of least excitability?—and further experiments have enabled him to return an affirmative reply to both these questions. The heart increases in temperature whilst it executes its mechanical work, and cools down as it relaxes. The moment when the heart is coldest, and consequently least excitable, is that when it has accomplished its period of cooling down. This will be the *début* of the systolic phase, and experiment is now in full accordance with theory.

### THE UNITED STATES AND VIVISECTION.

At the present time, when so much excitement prevails as to this question, it may be well to turn to what is the state of the law in regard to it in America—that is, among a people of the same religion and speaking the same language as ourselves, and more allied to us in every way than any other nation. The Session Laws of 1867 contain an Act entitled "An Act for the more effectual Prevention of Cruelty to Animals," which was passed April 12th, 1867. Section 10 lays down:—"Nothing in this Act shall be construed to prohibit or interfere with any properly conducted scientific experiments or investigations, which experiments shall be performed only under the authority of the faculty of some regularly incorporated medical college or university of the State of New York."

This Act took effect May 1st, 1867, and there has been no further legislation on the subject since that time.

### THE EFFECT OF PROLONGED MUSCULAR EXERCISE ON THE SYSTEM.

By F. W. PAVY, M.D., F.R.S.

(Concluded from August No., p. 384.)

In fulfilment of my design, my observations have been carried through the six days subsequent

to Mr. Weston's six-day walk. Whilst the urine has been steadily preserved and obtained for analysis from day to day, and the body-weight taken, the diet has been of so varied and complicated a nature that I do not think any useful purpose would be served by introducing the particulars furnished to me regarding it. It would be next to impossible to calculate with any degree of precision the nitrogen contained in it, and I must therefore be content with stating that it comprised a generous daily mixed allowance of animal and vegetable food. Hitherto there has been an abstinence from alcoholic beverages, but during the six days in question the record before me shows that Mr. Weston has not been a follower of strictly temperance principles. With the subjoined analytical results the collection of data is completed, and upon a future occasion I will collate and comment upon the bearings they possess in relation to the mooted question—the source of mechanical power from muscular action.

*First twenty-four hours after the six-day walk.*—Amount of urine passed, 1891·4 c.c. (49 oz.); specific gravity, 1031·4; free acidity, reckoned as oxalic acid, 1·89 gramme in 1000 c.c. (.828 grain in 1 oz.); dark-amber color, and clear. Microscopic characters: A few crystals of oxalate of lime. Composition in 1000 parts:—

|                                  |     |     |        |
|----------------------------------|-----|-----|--------|
| Water                            | ... | ... | 936·08 |
| Solid residue (dried at 240° F.) | ... | ... | 63·92  |

|                     |     |       |
|---------------------|-----|-------|
| Incinerated residue | ... | 18·87 |
|---------------------|-----|-------|

Organic constituents—

|                       |     |            |
|-----------------------|-----|------------|
| Urea                  | ... | 40·74      |
| Uric acid             | ... | 1·44       |
| Other organic matters | ... | 7·87—50·05 |

Mineral constituents—

|                 |     |           |
|-----------------|-----|-----------|
| Chlorine...     | ... | 1·69      |
| Sulphuric acid  | ... | 2·99      |
| Phosphoric acid | ... | 2·57      |
| Soda            | ... | 2·91      |
| Potash          | ... | 2·59      |
| Lime            | ... | ·24       |
| Magnesia        | ... | ·18       |
| Loss            | ... | ·70—13·87 |

63·92

Total quantity of solids excreted during the twenty-four hours:—

|                       |     |                                |
|-----------------------|-----|--------------------------------|
| Urea                  | ... | 58·422 grammes (801·45 grains) |
| Uric acid             | ... | 2·082 „ (31·35 „ )             |
| Other organic matters | ... | 11·286 „ (174·14 „ )           |
| Chlorine              | ... | 2·295 „ (35·88 „ )             |
| Sulphuric acid        | ... | 4·298 „ (66·35 „ )             |
| Phosphoric acid       | ... | 3·486 „ (56·78 „ )             |
| Soda                  | ... | 4·077 „ (64·34 „ )             |
| Potash                | ... | 8·728 „ (57·55 „ )             |
| Lime                  | ... | ·348 „ (5·37 „ )               |
| Magnesia              | ... | ·264 „ (4·01 „ )               |

Body-weight, without clothes, 8 st. 11 lb.

*Second twenty-four hours after the six-day walk.*—Amount of urine passed, 1022·3 c.c. (36 oz.); specific gravity, 1028·7; free acidity, reckoned as oxalic acid, ·93 gramme in 1000 c.c.

(407 grain in 1 oz.); amber color, slightly turbid from deposit of lithates. Microscopic characters: Amorphous lithate of soda, with a few crystals of oxalate of lime. Composition in 1000 parts:—

|                                  |     |     |        |
|----------------------------------|-----|-----|--------|
| Water                            | ... | ... | 951·11 |
| Solid residue (dried at 240° F.) | ... | ... | 48·89  |

|                     |     |       |
|---------------------|-----|-------|
| Incinerated residue | ... | 15·19 |
|---------------------|-----|-------|

Organic constituents—

|                       |     |            |
|-----------------------|-----|------------|
| Urea                  | ... | 80·59      |
| Uric acid             | ... | 1·21       |
| Other organic matters | ... | 1·90—33·70 |

Mineral constituents—

|                 |     |      |
|-----------------|-----|------|
| Chlorine...     | ... | 4·97 |
| Sulphuric acid  | ... | 1·25 |
| Phosphoric acid | ... | 1·81 |
| Soda            | ... | 4·72 |
| Potash          | ... | 2·41 |
| Lime            | ... | ·30  |
| Magnesia        | ... | ·19  |

15·19

|             |     |       |
|-------------|-----|-------|
| Less excess | ... | ·46   |
|             |     | 48·89 |

Total quantity of solids excreted during the twenty-four hours:—

|                       |     |                                |
|-----------------------|-----|--------------------------------|
| Urea                  | ... | 32·193 grammes (496·85 grains) |
| Uric acid             | ... | 1·277 „ (19·70 „ )             |
| Other organic matters | ... | 2·879 „ (86·70 „ )             |
| Chlorine              | ... | 5·232 „ (80·70 „ )             |
| Sulphuric acid        | ... | 1·318 „ (20·37 „ )             |
| Phosphoric acid       | ... | 1·911 „ (29·47 „ )             |
| Soda                  | ... | 4·967 „ (76·64 „ )             |
| Potash                | ... | 2·534 „ (39·04 „ )             |
| Lime                  | ... | ·317 „ (4·89 „ )               |
| Magnesia              | ... | ·204 „ (3·14 „ )               |

Body-weight, 8 st. 13 lb. 8 oz.

*Third twenty-four hours after the six-day walk.*—Amount of urine passed, 1718 c.c. (60½ oz.); specific gravity, 1027·4; free acidity, reckoned as oxalic acid, ·93 gramme in 1000 c.c. (.407 grain in 1 oz.); amber color, and clear. Microscopic characters: A few crystals of uric acid and oxalate of lime. Composition in 1000 parts:—

|                                  |     |     |        |
|----------------------------------|-----|-----|--------|
| Water                            | ... | ... | 953·25 |
| Solid residue (dried at 240° F.) | ... | ... | 46·75  |

|                     |     |       |
|---------------------|-----|-------|
| Incinerated residue | ... | 18·67 |
|---------------------|-----|-------|

Organic constituents—

|                       |     |            |
|-----------------------|-----|------------|
| Urea                  | ... | 29·19      |
| Uric acid             | ... | 1·12       |
| Other organic matters | ... | 2·77—33·08 |

Mineral constituents—

|                 |     |           |
|-----------------|-----|-----------|
| Chlorine...     | ... | 2·88      |
| Sulphuric acid  | ... | 2·12      |
| Phosphoric acid | ... | 1·85      |
| Soda            | ... | 3·68      |
| Potash          | ... | 2·52      |
| Lime            | ... | ·20       |
| Magnesia        | ... | ·17       |
| Loss            | ... | ·35—13·67 |

46·75

Total quantity of solids excreted during the twenty-four hours:—

|                                |                                |
|--------------------------------|--------------------------------|
| Urea ...                       | 51.540 grammes (795.26 grains) |
| Uric acid ...                  | 1.976 " (30.48 " )             |
| Other organic mat-<br>ters ... | 4.879 " (75.31 " )             |
| Chlorine...                    | 5.085 " (78.88 " )             |
| Sulphuric acid ...             | 8.745 " (57.71 " )             |
| Phosphoric acid                | 8.264 " (50.30 " )             |
| Soda ...                       | 6.494 " (100.14 " )            |
| Potash ...                     | 4.449 " (68.66 " )             |
| Lime ...                       | .359 " (5.49 " )               |
| Magnesia ...                   | .309 " (4.77 " )               |

Body-weight, 9 st. 1 lb. 4 oz.

*Fourth twenty-four hours after the six-day walk.*—Amount of urine passed, 2214.9 c.c. (78 oz.); specific gravity, 1018.9; free acidity, scarcely appreciable; straw color, and clear. Microscopic characters: A few crystals of uric acid. Composition in 1000 parts:—

|                                  |        |
|----------------------------------|--------|
| Water ...                        | 972.14 |
| Solid residue (dried at 240° F.) | 27.86  |

Incinerated residue ... 10.15

Organic constituents—

|                                |           |
|--------------------------------|-----------|
| Urea ...                       | 16.67     |
| Uric acid ...                  | .63       |
| Other organic mat-<br>ters ... | .41—17.71 |

Mineral constituents—

|                    |      |
|--------------------|------|
| Chlorine...        | 8.63 |
| Sulphuric acid ... | 1.10 |
| Phosphoric acid    | 1.17 |
| Soda ...           | 2.76 |
| Potash ...         | 1.85 |
| Lime ...           | .11  |
| Magnesia ...       | .08  |

Less excess ... .05 10.15

27.86

Total quantity of solid matter excreted in the twenty-four hours:—

|                                |                                |
|--------------------------------|--------------------------------|
| Urea ...                       | 37.655 grammes (580.94 grains) |
| Uric acid ...                  | 1.439 " (22.21 " )             |
| Other organic mat-<br>ters ... | .925 " (14.28 " )              |
| Chlorine...                    | 8.194 " (126.43 " )            |
| Sulphuric acid ...             | 2.503 " (38.57 " )             |
| Phosphoric acid                | 2.658 " (40.00 " )             |
| Soda ...                       | 6.603 " (101.88 " )            |
| Potash ...                     | 8.056 " (47.15 " )             |
| Lime ...                       | .261 " (4.01 " )               |
| Magnesia ...                   | .199 " (3.08 " )               |

Body-weight, 9 st. 1 lb. 12 oz.

*Fifth twenty-four hours after the six-day walk.*—Amount of urine passed, 1845.8 c.c. (65 oz.); specific gravity, 1024.6; free acidity, reckoned as oxalic acid, .504 gramme in 1000 c.c. (.22 grain in 1 oz.); amber color, clear. Microscopic characters: Crystals of oxalate of lime. Composition in 1000 parts:—

|                                  |        |
|----------------------------------|--------|
| Water ...                        | 954.04 |
| Solid residue (dried at 240° F.) | 45.96  |

Incinerated residue ... 13.56

Organic constituents—

|                                |            |
|--------------------------------|------------|
| Urea ...                       | 21.93      |
| Uric acid ...                  | .72        |
| Other organic mat-<br>ters ... | 9.75—32.40 |

Mineral constituents—

|                    |           |
|--------------------|-----------|
| Chlorine...        | 3.74      |
| Sulphuric acid ... | 2.46      |
| Phosphoric acid    | 1.69      |
| Soda ...           | 8.26      |
| Potash ...         | 1.66      |
| Lime ...           | .23       |
| Magnesia ...       | .12       |
| Loss ...           | .50—13.56 |

45.96

Total quantity of solids excreted during the twenty-four hours:—

|                                |                                |
|--------------------------------|--------------------------------|
| Urea ...                       | 40.612 grammes (626.61 grains) |
| Uric acid ...                  | 1.347 " (20.47 " )             |
| Other organic mat-<br>ters ... | 18.456 " (284.68 " )           |
| Chlorine...                    | 6.940 " (107.08 " )            |
| Sulphuric acid ...             | 4.559 " (69.36 " )             |
| Phosphoric acid                | 8.148 " (48.57 " )             |
| Soda ...                       | 6.221 " (95.99 " )             |
| Potash ...                     | 8.082 " (47.55 " )             |
| Lime ...                       | .424 " (6.54 " )               |
| Magnesia ...                   | .221 " (3.40 " )               |

Body-weight, 9 st. 2 lb.

*Sixth twenty four hours after the six-day walk.*—Amount of urine passed, 2470.5 c.c. (87 oz.); specific gravity, 1017.18; free acidity, scarcely appreciable; pale-amber color and clear. Microscopic characters: Crystals of uric acid, with a few crystals of oxalate of lime. Composition in 1000 parts:—

|                                  |        |
|----------------------------------|--------|
| Water ...                        | 972.73 |
| Solid residue (dried at 240° F.) | 27.27  |

Incinerated residue ... 10.94

Organic constituents—

|                                |            |
|--------------------------------|------------|
| Urea ...                       | 14.05      |
| Uric acid ...                  | .79        |
| Other organic mat-<br>ters ... | 1.49—16.33 |

Mineral constituents—

|                    |      |
|--------------------|------|
| Chlorine...        | 8.47 |
| Sulphuric acid ... | 1.10 |
| Phosphoric acid    | 1.57 |
| Soda ...           | 8.53 |
| Potash ...         | 1.19 |
| Lime ...           | .12  |
| Magnesia ...       | .06  |

10.94

Less excess ... .10 27.27

Total quantity of solids excreted in the twenty-four hours—

|                                |                                |
|--------------------------------|--------------------------------|
| Urea ...                       | 85.822 grammes (552.70 grains) |
| Uric acid ...                  | 2.000 " (30.36 " )             |
| Other organic mat-<br>ters ... | 8.742 " (57.74 " )             |
| Chlorine...                    | 8.745 " (134.93 " )            |
| Sulphuric acid ...             | 2.767 " (42.69 " )             |
| Phosphoric acid                | 8.952 " (60.98 " )             |
| Soda ...                       | 8.893 " (137.21 " )            |

|                                |     |                              |
|--------------------------------|-----|------------------------------|
| Potash ...                     | ... | 3.014 grammes (46.50 grains) |
| Lime ...                       | ... | .321 " (4.95 " )             |
| Magnesia ...                   | ... | .178 " (2.67 " )             |
| Body-weight, 9 st. 2 lb. 4 oz. |     |                              |

## News Items, Medical Facts, &c.

**EMBOLISM.**—At a meeting of the Medical Society of Strasburg, Dr. Roth stated that he was called to a patient suffering from phlegmasia alba dolens on the left side, and who had been confined a fortnight. She made rather light of her complaint, and used to get up a little in the course of the day. On Dr. Roth's visit the patient was sitting up in bed and talking to her friends. On examination, a knot of varicose veins was noticed half way up the left thigh, and another of the same nature on the right side. The surgeon now passed his hand lightly over the latter tumour, and the patient immediately fainted, fell back on the pillow, turned her head on one side, drew a deep breath several times, and expired in a few moments. Dr. Roth was, of course, greatly shocked at this sad occurrence, and judged that the cause of death must be embolism of the pulmonary artery. The slight pressure on the congeries of varicose veins had probably given rise to the migration of a clot. Dr. Schützenberger thought this explanation perfectly admissible, and recollected a similar case, under the care of Dr. Koeberle, where the clot was found in the pulmonary artery. Dr. Schützenberger had himself treated two brothers suffering from varicose veins, the complaint running in the family. One of them had, besides, phlebitis of the leg, and was progressing favorably, when he was seized with choking in the night, and immediately died. No post-mortem was allowed, but there is no doubt that the explanation was similar to that mentioned above. Some years afterwards the surviving brother died exactly in the same manner.

**THE TREATMENT OF POLYURIA.**—M. Hayem mentioned at a meeting of the Paris Biological Society, March 18th, 1876, the case of a man aged forty-eight, who had enjoyed good health up to 1867, when he suffered from a nervous attack, loss of consciousness, and paralysis of the right arm. In 1874 the sight became impaired. The patient remained in good health up to February, 1875, when he became affected with polyuria, polyphagia, and polydipsia, soon connected with nocturnal incontinence of urine. He was ordered issues to the lumbar region, and iodide of starch. When the patient was first seen by M. Hayem, the face was puffed and the lower limbs oedematous. The urine did not contain any albumen, but a certain amount of sugar. He voided in the twenty-four hours four quarts and a half of urine, half an ounce of urea per quart—viz., about two ounces altogether. After a treatment of twenty-eight days, the patient taking about one grain of opium per diem, the quantity of urine diminished to about three pints per day, and the urea to less than half an ounce per quart—viz., seven drachms in the twenty-four hours. The general health was much improved. It is supposed that the opium acted as an alterative of the nervous system. In similar cases Trousseau and Bouchard succeeded with valerian.

**ROTATORY MOVEMENTS OF THE HEAD AND NECK.**—Dr. Bonnet de Malherbe, Physician at the Neris watering-place in France, records in *L'Union Médicale* of April 25th, 1876, the case of a man of thirty-five, who suffered from this complaint. The sharp rotatory movements occurred about fourteen times a minute, but the general health was tolerably good. This patient had had several attacks of rheumatism, and it was thought that the convulsive movements were connected with that complaint; but this supposition was negatived by the complete failure of the thermal treatment of rheumatism. Trousseau (*Clinique*, vol. ii.) mentions one case only of the kind under the head of Chorea. M. Jaccoud, in his "Traité de Pathologie," gives a good description of this disease under the head of Hyperkinesia of the Nervus Accessorius of Willis, which supplies the trapezius and

sterno-mastoid. The disease has been observed more frequently in Germany and England, but has proved incurable.

**COMPARATIVE TEMPERATURE OF DIFFERENT PARTS OF THE GLOBE.**—An interesting table is published by the *Colonies*, in which is given the range of temperature observed at different stations in various quarters of the globe during the year 1875. It appears that the lowest shade temperature was marked at Manitoba, by Lake Winnipeg, where the spirit thermometer registered  $-43.1^{\circ}$  ( $75^{\circ}$  below freezing point) on Jan. 8th. On the other hand, in Ceylon the temperature of the coldest night was just above  $70^{\circ}$ . The table shows, too, that in Melbourne, while the range ( $110.4^{\circ}$  to  $31.1^{\circ}$ ) was considerably wider than in many other stations at which observations were made, the maximum height was greater by nearly one degree than the highest record even in Madras ( $109.6^{\circ}$ ). As a general rule, it appears that the range of temperature is widest in the centre of continents, less on the coasts, and least of all on small isolated islands.

**HYPERPYREXIA IN A PRIMIPARA.**—Dr. S. W. Torrey reports, in the *Boston Medical and Surgical Journal*, a case in which a woman, after natural delivery of a first child, went on well until the third day, when she became restless and complained of the tenderness of her breasts. She also suffered from protracted piles, the severe pain from which prevented continuous sleep during the preceding night. Dr. Torrey found the patient with a pulse of 106, respiration natural, and a temperature under the tongue, at the end of three minutes, of  $108^{\circ}$ , and at the end of five minutes of  $108.5^{\circ}$ . A mass of hemorrhoids was protruding from the anus, not inflamed, and easily returned by gentle manipulation. There was neither nausea, abdominal pain, nor sensitiveness over the uterus on pressure. Dr. Torrey attributes the hyperpyrexia to the irritation of the lower bowel in conjunction with the milk fever.

In the last number of the *Pharmaceutical Journal* Mr. B. Proctor, of Newcastle, cautions the trade against a quantity of Persian opium now offered for sale at about one-third of the price of good specimens of the drug. Mr. Proctor obtained a small portion which he submitted to analysis. The result proved the presence of only 0.25 per cent. of morphia. Good opium should contain from 6 to 8 per cent. of morphia. There are few who have largely used the preparations of opium—and we would especially particularise the Pil. Saponis Co. of the Pharmacopœia—who have not observed remarkable variations in the potency of the different samples. The price at which Persian opium is now sold throws a light on this unequal strength.

MEDICAL visitors to the Great Exhibition at Philadelphia will have their attention arrested by a model hospital which has been erected by the Army Medical Department in the neighborhood of the Government building. It is replete with every imaginable appliance requisite for the treatment of the wounded in battle, with miniatures of steamboats and railroad trains arranged for the transportation of sick and wounded, and models of the barrack hospitals improvised during the American war. On the wall are hung photographs of the remarkable cases of recovery from hip amputations, &c., reported by Dr. Otis.

WE learn that "at the last session of the Kentucky Legislature, the odious annual tax of ten dollars per head levied on the physicians of Louisville by the city authorities was abrogated. The profession is indebted to the Louisville representatives generally, and to Senator Green Hays specially, for this act of justice."

**POISONING BY CARBOLIC ACID.**—As this acid is now so extensively used, it may be of some importance to make known the antidotes which have been proposed. M. Ferrand advises the following:—White sugar, 15 parts; water, forty parts; quicklime, 5 parts—forming a saccharate of lime.

PRINTED AND PUBLISHED BY

WM. C. HERALD, Nos. 52 & 54 JOHN ST., NEW YORK.

# THE LANCET.

A Journal of British and Foreign Medicine, Physiology, Surgery,  
Chemistry, Criticism, Literature, and News.

JAMES G. WAKLEY, M.D., M.R.C.S., EDITOR.

PUBLISHED MONTHLY.

No. 10.

NEW YORK, OCTOBER, 1876.

## Lectures

ON

### QUESTIONS IN OPHTHALMIC SURGERY.

*Delivered at the Royal College of  
Surgeons,*

By R. BRUDENELL CARTER, F.R.C.S.,

Hunterian Professor of Surgery and Pathology to the College,  
and Ophthalmic Surgeon to St. George's Hospital.

#### LECTURE II.—PART I.

##### ON GLAUCOMA.

MR. PRESIDENT,—In a Manual of Ophthalmic Medicine and Surgery, published in 1865 by Mr. Wharton Jones, I find the following definition of glaucoma:—"Glaucoma is a name applied to a peculiar greenish opaque appearance, deep behind the pupil, changing its seat according to the direction in which the light is admitted, being always most concentrated on the side opposite the light. This appearance occurs in very different degrees, from a greenish-grey reflection barely discernible, to a grass-green opacity."

The same author divides glaucoma into five groups—namely:—1. Simple glaucoma. 2. Glaucoma with cataract. 3. Chronic glaucoma with amaurosis. 4. Acute glaucoma with amaurosis. 5. Chronic glaucoma, with amaurosis and cataract.

He defines simple glaucoma as a state in which "we have the glaucomatous appearance behind the pupil, but the eye, in other respects, appears healthy, the cornea clear, the pupil lively, the consistence of the eyeball normal, and vision—with the exception that it may be presbyopic or myopic—good." He continues that simple glaucoma "is of frequent occurrence in old people. It continues for life, but does not necessarily become complicated either with cataract or amaurosis." He treats these latter conditions, it will be observed, as complications of a color phenomenon which he regards as the essence of "glaucoma"; and he afterwards refers his three amaurotic groups to the

occurrence, in glaucomatous eyes, of acute or chronic "arthritic posterior internal ophthalmia."

I have quoted these definitions and opinions, Mr. President, merely that they may serve as landmarks from which to measure the subsequent progress of thought, and the change which has occurred in the current meaning of language. If we regard the question from the point of view of etymology alone, there can be no doubt that Mr. Wharton Jones's definition of simple glaucoma must still be substantially correct, and that this phrase is properly applied to denote a mere color phenomenon. But, as a matter of fact, the color phenomenon does not require a phrase; it is an accidental consequence of alterations which are natural or physiological, which take place, to a greater or less extent, in all eyes during the decline of life, and which are made up of two chief factors: first, that the crystalline lens loses its original limpidity and acquires somewhat of an amber tint; secondly, that the choroid undergoes changes in its pigmentation and in its blood-supply. There is, therefore, more light returned from the fundus oculi to the observer, and this light comes to him through a colored medium. The condition is a simple senile change, and there is no connexion between this change and those which so often produce loss of vision. The latter are distinctly states of disease, and the name glaucoma, although it has no real applicability to them, has been retained in order to express them. Its employment in this way has now become so completely an established custom, both in this country and on the Continent, that there is little or no prospect of its ever being superseded; and it is only necessary to remember that the word, in its modern and accepted signification, has no reference to color, but is used to denote a certain group of morbid conditions by which loss of sight is commonly produced.

The essential character of these morbid conditions, in every case, however much the external signs may at first appear to vary, is an increase in the fluid contents of the eyeball in relation to the size of the containing cavity; and this increase, by distending the ocular tunics, produces a state of hardness or heightened tension. The tension of the eye is best estimated by causing the patient to look downwards, with drooping or slightly closed

lids, and by then placing the tips of the two fore-fingers upon the upper lid, as far under the margin of the orbit as they can be carried. If the eyeball is then steadied or supported with one finger, and lightly pressed upon with the other, it will, if healthy, be found to dimple or yield under moderate pressure, with a peculiar elastic resistance which each observer may learn to estimate upon himself. It is true that the tension of apparently healthy eyes may vary within rather wide limits; but, notwithstanding this, there is seldom any practical difficulty in determining whether the tension in any given case does or does not overstep the limits of physiological variation: It may overstep these limits, of course, in two directions, the eye being either harder or softer than in its normal state; and, almost as soon as this fact was recognised, attempts were made to arrive at some standard to which the variations could be referred, and by which they could be measured. The most successful attempt in this direction was that of Mr. Bowman, who devised his well-known scale of nine  $T$ 's, by which to express all the conditions which were ordinarily encountered. According to this scale  $T_0$  represents normal tension; and the letter  $T$ , with a plus or a minus sign, and a numeral, represents increase or diminution. In order to meet doubtful cases, a note of interrogation is substituted for a numeral, so that  $+T?$  would represent a doubtful increase, and  $-T?$  would represent a doubtful diminution.  $+T_1$  would represent unquestionable increase, and  $+T_2$ ,  $+T_3$ , would represent still higher degrees. On the other hand,  $-T_1$ ,  $-T_2$ , and  $-T_3$ , would represent three corresponding grades of diminution.

Endeavors have been made, especially in Holland, to determine tension more exactly than by variable and uncertain human sensations; and Drs. Snellen, Monnik, and Dor have bestowed much labor upon the construction of instruments called ophthalmotonometers, intended to measure ocular tension by mechanical movement. For the purposes of physiological experiment such instruments may be highly useful, but I do not think they would ever establish a diagnosis when educated surgical fingers were at fault. The fingers, however, can only be trusted when they are employed in the right way; and efforts to estimate tension by a single finger, or without perfect consentaneous action between the two, will only be productive of erroneous conclusions. A small hard eyeball, in an orbit from which much of the fat has been absorbed, will appear non-resistant to a single finger, because it may be readily pushed back into the orbit; and similar sources of error beset all careless methods of palpation. The tension of an eye should be estimated as carefully as the sensations conveyed by the finger in a case of obscure or doubtful fluctuation; and, if this be done, Mr. Bowman's scale will be found sufficient for recording the facts under all ordinary circumstances. The obvious objection to it, that it provides no means of accurately comparing the records of different observers, seems to be a difficulty which is inherent in the nature of the case, and which cannot be obviated except by some mechanical contrivance.

The sclerotic coat of the eye being an almost unyielding membrane, it is manifest that any considerable diminution of its fluid contents must deprive its contained structures of support to which they are accustomed, and that any considerable increase of its fluid contents must subject the con-

tained structures to compression. It is therefore also manifest that the functional integrity of the organ requires any such variations to be restrained within definite limits; but it is not clear how this requirement is provided for, and the physiological question of the maintenance of the proper balance between secretion and absorption within the eye is one that cannot at present be said to be at all fully understood. The formation of the fluid contents—that is to say, of the vitreous and the aqueous humors—must be attributed partly to secretion (a process which is manifestly controlled by the nervous system) and partly to mere transudation or osmosis through the walls of the blood-vessels. The removal of fluid may be partly by its reabsorption into the bloodvessels, and partly by its transudation through the cornea or other of the ocular tunics. Besides the changes which may be occasioned by such methods, there is some reason to believe that the choroid itself admits of an afflux or of an efflux of blood, by which it is able to exert a compensating influence upon other and accidental sources of variation, admitting always as much blood as may be required to maintain the proper degree of fullness of the ocular cavities. In some birds there seems to be no doubt that an appendage to the choroid, termed the pecten, is likely to act in this manner, and that by variations in the quantity of its contained blood it permits internal changes, which are contributory to the remarkable range of vision which many birds are known to possess.

Regarding the question by the light of common clinical facts, we must recognise two conditions by which an increase of tension is commonly occasioned. The first of these is nervous irritation, either central or peripheral; the second is an arrest of transudation through the cornea. Weguer, in 1856, was the first to direct attention to the frequent occurrence of high ocular tension in connexion with severe neuralgia; and I believe that this combination of occurrences is much more frequent than is commonly supposed. My friend the late Dr. Anstie was kind enough to make some observations on this point at my request; observations which were cut short by his untimely death, and of the results of which I only know that he more than once told me that there was plentiful evidence in support of my impression. Everyone who has had opportunities of watching cases of trifacial neuralgia knows how frequently the sight of the eye of the affected side is rendered dim during the severity of the paroxysm; and I believe it will almost invariably be found that this dimness of sight is associated with, and is undoubtedly produced by, a temporary increase of tension. Moreover, herpes frontalis, which we now know to be a consequence of an inflammatory condition of the corresponding Gasserian ganglion, is frequently attended or followed by increased ocular tension; so that of the general influence of nerve irritation, in producing such a state, no question can be reasonably entertained. The effect of the arrest of transudation through the cornea is best seen in those cases of chronic iritis which ultimately produce entire closure of the pupil. As long as any pupillary aperture remains—that is, as long as fluid can pass from behind the iris into the anterior chamber,—no considerable increase of tension is commonly found to occur. As soon, however, as the pupil is entirely closed, so that fluid can no longer pass into the anterior chamber, it begins to accumulate



behind the iris, and to produce an increase of tension which, if not promptly relieved, will inevitably lead to the disorganisation of the eye. It would seem, therefore, as if the passage into the anterior chamber were equivalent to a passage of exit from the eye; and, if this be so, the only means of exit must be by transudation through the cornea.

Transudation through membranes, as is well known, may occur either by the simple method of exchange known as endosmosis and exosmosis, in which, as a rule, the larger current sets from the fluid of less to the fluid of greater density; or by the process called dialysis, in which the transudation and exchange are governed by laws which are as yet only very imperfectly understood. This much, however, is certain, namely, that the occurrence of dialysis is greatly influenced by unknown conditions of the separating membrane, and that it may be altogether arrested although the membrane has not undergone any appreciable physical change. We can therefore only say, with regard to the ocular membranes generally, that they may possibly have some share in the production of heightened tension, and that, if so, such share is likely to be due to their having undergone what Dr. Richardson has described as "pectous change." The whole of this part of the subject is still in the region of pure hypothesis, but it certainly both requires and deserves investigation.

The general pathology of glaucoma was first clearly stated by von Graefe in 1855, and in 1862 Professor Donders furnished an explanation of the chain of morbid action, which has since been very extensively received, and which, although it has been disputed by some writers, appears to me to be in more strict accordance both with physiological knowledge and with clinical facts than any of the hypotheses which have been advanced in opposition to it. According to this view, the increase of tension is usually produced by some irritation, either direct or reflex, of the nerves which govern the secreting function within the eye; and any inflammation which may occur in the course of glaucoma is essentially a secondary phenomenon, or complication, excited by the pressure, and maintained by the impediment to the circulation which that pressure occasions. The distinct enunciation of this, which may be called the neuropathic hypothesis, led to a large number of experiments upon animals, for the purpose of discovering the share taken by the trifacial and by the sympathetic nerves, respectively, in determining the calibre of the intraocular bloodvessels, and the secretion of the intraocular fluids. I cannot say that these experiments have led to any conclusions which appear to me to be either important or trustworthy; and when, as sometimes happens, I find that different experimenters are not entirely of one mind about the results of the same proceeding, I am not in a position to decide upon the relative accuracy of either. It is certain that, in the human subject, anything which can fairly be called glaucoma is always, or nearly always, a final result of combined morbid and senile changes which have been very gradually brought about; and I cannot imagine that these gradual changes can ever be imitated with sufficient closeness, in the previously healthy eye of an animal submitted to experiment, to afford a basis for conclusions of the smallest practical value. A better understanding of the pathology of glaucoma will be reached, if it is

reached at all, by the direction of general professional attention to this and to kindred subjects; so that nutritive changes in the eyes may be discovered, and their course and progress observed, before they reach a stage at which they begin to affect the sight, and at which they send the patient to a specialist for the recognition of an advanced degree of an abnormal condition. I think we may now say, with perfect security against error, that we have abundant evidence of the effect of nervous irritation, either direct or reflected, in producing increased intraocular tension. The evidence of a direct influence is afforded, as I have already said, by the heightened tension which so often attends or follows trifacial neuralgia or trifacial herpes; and the evidence of an indirect influence is afforded by the heightened tension which often occurs, and which is then commonly called secondary glaucoma, in the course of other diseases of the eye. Among these diseases, adhesions of the iris, and certain forms of inflammation of the cornea, hold a prominent place; and they all have the common character that they are attended by a high degree of manifest nervous irritation. Dr. Landsberg, of Berlin, has lately described cases of glaucoma which have followed long-standing changes in the blood-vessels of the retina, and has thus enlarged the field of the possible initiatory causes of the disease.

Besides the various forms of the neuropathic hypothesis, it has been suggested, first, I think, by Professor Coccus, that there is in glaucoma a diminution of the scleral cavity, by a process of senile hardening or involution of that membrane. It is, at least, not unlikely that some degree of such a change may occur, and that, if not strictly causative, it may yet be contributory in its action. It may not be associated with that pectous change in the internal membranes which I have already mentioned as a possible element or factor in the general result.

In a discourse so brief as this, Mr. President, I must not suffer myself to linger over the tempting theme which is afforded by the conceivable or even the probable causes of heightened tension, but must proceed at once to consider the consequences which flow from such tension when it is established. And of these consequences one of the first and most important is this: that, by reason of the mechanical conditions of the intraocular circulation, the heightened tension provides for its own continuance and increase. The bloodvessels which perforate the sclerotic are conveyed through channels of considerable obliquity; and hence even a moderate heightening of intraocular tension places a serious mechanical obstacle in the way of the escape of venous blood from the cavity of the eyeball. There is also a certain degree of impediment to the entrance of arterial blood; but, as the forces which propel arterial blood are more powerful than those which determine the outflow of venous blood, the practical result is that blood gets into a tense eye with greater facility than it can get out again, so that, supposing the original increase of tension to have been due to an increased amount of fluid secretion, this is likely soon to be augmented by the presence also of an increased amount of blood. When, as happens in an ordinary neuralgic paroxysm, the cause of increased tension is not only temporary, but is also of short duration, the equilibrium of the circulation is gradually restored when the cause ceases to act;

but, on the other hand, when the cause is more abiding, or is sufficiently active to produce a larger increment of fluid than can be readily disposed of by any natural means of outflow or compensation, the immediate effect is that the whole intraocular circulation is impeded, and that the organ is placed, with regard to all nutritive or reparative changes, much in the position of a finger around which a ligature has been tied. Hence it is clear that, in heightened tension generally, whether this be primary or a secondary consequence of other changes, we have to recognise the existence of a physical condition which is itself a powerful cause of morbid action, and which naturally suggests the employment of some mechanical remedy for its cure.

Supposing high tension to exist as a confirmed condition, not in a very high degree, but gradually developed and slowly increasing, it seems not difficult to predict the effects which it must necessarily produce. First, there would be the hardness of the eyeball, easily discoverable by careful palpation. Next, there would be the effect upon the circulation: the eye would be passively congested; and evidence of this congestion would be given by dilatation of its veins, both internal and external. The external veins most accessible to observation are those branches which pierce the sclerotic at a short distance from the corneal margin, and course backwards beneath the conjunctiva. Accordingly, in heightened tension, these veins soon become dilated, winding, and conspicuous. Examined by the ophthalmoscope, the veins of the retina present very similar conditions, and, besides passive congestion, they often present also an appearance of visible pulsation, limited to the surface of the optic disc. The explanation of this phenomenon is that the arterial blood, entering the full eye with difficulty, and therefore entering with full force only at the acme of the pulse-wave, thrusts back a certain amount of venous blood in order to make room for itself; and thus, as the arterial blood forces its way, the venous blood is pushed in the direction of the capillaries, and momentarily recedes from the surface of the disc, to return as soon as the arterial pressure is diminished in the intervals between the pulse-waves. Under a still higher degree of impediment, an arterial pulse is produced, and its mechanism is equally simple. The arterial current is not only diminished between the pulse-waves, but in these intervals is absolutely stopped and arrested. In the venous pulse, which results from the lower degree of abnormal pressure, the blood in the retinal veins recedes from the centre of the disc towards the periphery, and returns from the periphery towards the centre. In the arterial pulse, which indicates a higher degree of pressure, the blood recedes from the periphery of the disc towards the centre, and returns from the centre towards the periphery. In order to watch these changes, and to distinguish the arteries from the veins with certainty, it is necessary to use what is known as the direct method of ophthalmoscopic examination.

While such are the mechanical effects of increased tension upon the circulation, the nerves of the eyeball are also being subjected to direct compression. The optic disc presents a flat surface to the pressure; and from this flat surface fibres proceed, to turn in bold curves around the margin of the opening in the sclerotic by which the optic nerve enters the eye, and to spread themselves out

in the retina. The ciliary nerves, which contain filaments from the third and fifth pairs and from the sympathetic, enter the eye near the optic nerve, and pass forwards, prior to their distribution, between the sclerotic and the choroid. In this position, they also are necessarily compressed; and the compression produces diminution of functional activity in the parts which they supply.

On these mechanical changes, it necessarily follows that grave functional changes must supervene. Glaucoma is a disease which chiefly, although by no means exclusively, attacks persons who have passed the middle period of life, and who are naturally beginning to experience that diminution of the power of accommodating the eyes for near objects which is incidental to advancing years. But the compression of the ciliary nerves, in so far as it acts upon their filaments derived from the third, still further diminishes this power of accommodation, to which the third nerve is contributory: and it also tends to weaken the sphincter of the pupil, which is supplied with motor energy from the same source. The compression of the sensory filaments, derived from the fifth, at first produces a certain degree of numbness, or anaesthesia, which, if the pressure is increased, often passes into acute pain. The compression of the retina, and the derangement of its circulation, together produce impairment of vision; and this impairment, although it is generally universal, is yet usually most declared at the peripheral parts of the membrane, and thus explains the phenomenon which is described as contraction of the field of vision. The surface of the optic nerve is the least resisting part of the surface of the posterior ocular cavity, and, under a steady increment of fluid, something must give way. The nerve-surface yields, and is pushed back, so to speak, out of the eye, becoming converted into a cup or excavation. As it recedes, it drags the retinal fibres backwards, causes them to bend round the sclerotic opening at a sharper angle than formerly, and subjects them, especially at this angle, to increased compression. The result is that the retina as a whole, and first the portion immediately around the nerve-entrance, undergoes wasting and decay.

When the increase of pressure is extremely slow and gradual, and, it may be presumed, only in the case of persons of somewhat torpid nervous sensibility, the phenomena of glaucoma may from first to last be unattended by pain, and vision may slowly fade away under the influence of an atrophy occasioned by the compression of nerves and blood-vessels. The patient, in such cases, usually complains only of falling sight, and a careful investigation of his history will probably show that his troubles first took the form of premature or rapidly increasing presbyopia. He often sought relief from stronger and still stronger spectacles, and every such increase of power was serviceable for a time. On examination of the eyes, the pupils are large for the period of life, and contract sluggishly, and the surface of the cornea is less sensitive to contact than in the normal state. Sometimes the pulp of a finger may be gently laid upon it, without exciting any contraction of the orbicularis, and without the patient appearing to be conscious of the touch. The field of vision will be somewhat narrowed in, often more on the nasal than on the temporal side, but yet, on the whole, concentrically, and not irregularly or in sectors. The

eyes will be a little hard, and, if one is worse than the other, the worse eye will usually also be the harder of the two. Very often ophthalmoscopic illumination will display some striae of commencing cataract at the peripheral part of the lens, while the media are still transparent in the axis of vision. The optic disc will have a generally pale aspect, and its surface will be a little concave or saucer-like. It will often be bounded by a well-defined white ring, which is the edge of the sclerotic foramen, rendered unusually visible by the wasting of the nerve-fibres which bend around its margin, and which, in the natural state, more or less damp its whiteness, and conceal it from view. The arteries will be pale and small, the veins more conspicuous, somewhat dark, full, and winding. In the veins, and perhaps also in the arteries, a pulse will be visible, or may be produced by very light digital pressure upon the globe. If left without effectual treatment, such a case goes steadily, even if slowly, from bad to worse, and ultimately the sight becomes totally extinguished. The condition was long known as "atrophy with excavation of the optic nerve," and is now called simple, or simple chronic, glaucoma. It may serve as a convenient clinical basis for the study of other and more acute forms of the malady.

## LECTURE II.—PART II.

### ON GLAUCOMA.

THE state of simple glaucoma, then, is essentially one of atrophy, differing from what may be called idiopathic or central atrophy in being due to pressure, and therefore in being attended by evidences of pressure which may be detected if they are carefully looked for. It also differs from idiopathic atrophy in requiring a totally different treatment; for, while the latter can be controlled, if at all, only by means which exert their influence upon the nervous centres, the former can be controlled only by the removal of the hurtful pressure in which it has its origin. The diagnosis must rest mainly upon the hardness of the eyeball, upon the fulness of the external and of the retinal veins, and upon the actual or readily induced pulsation in the latter; and in any case which admitted of *bonâ-fide* doubt, it would be proper to give the patient the benefit of that doubt by the performance of iridectomy, which, while it would be certainly harmless as against central atrophy, would probably be curative as against glaucoma. Iridectomy is required in so many other states besides glaucoma that I purpose to devote a lecture to the consideration of the *rationale* of its various uses, and to defer until then much of what I have to say upon the principles which should regulate the treatment of tension generally. Still it would be improper in this place to omit the statement that iridectomy is the single remedial measure in which, in all the forms of glaucoma, we may repose a certain degree of confidence. Glaucomatous conditions may be beyond the reach of treatment altogether; but, so long as they are curable, it is only by iridectomy, or by some kindred proceeding, that they can be cured.

In a very large proportion of cases, glaucoma deviates from the simple type already described: first, in being more acute—that is to say, in occu-

pying a shorter period of time for its complete development; and, secondly, in being attended by pain and by active or inflammatory congestion. I have been accustomed to assume that the severity of the symptoms depends mainly upon the rate of progress; and that, while a slowly increasing tension gives the ocular tunics time to accommodate themselves to the new conditions in which they are placed, a rapid increase leads to inflammatory reaction. I think there can at least be no doubt that this view affords an adequate explanation of the presence or absence of pain; and that the degree of severity of pain bears a general relation to the rate at which tension increases. It is highly probable, moreover, that pain and inflammation, when once excited, may themselves, as sources of nervous irritation, serve to intensify the conditions in which they had their origin.

For convenience of description, it is usual to recognise, besides the simple or chronic glaucoma, three other types of the disease—the subacute, the acute, and the fulminating; and also to recognise, in each case, four stages—the impending or threatening stage, the prodromal, the actual, and the completed. There is in all this a certain affectation of precision which does not seem to me to be entirely in accordance with clinical fact, or with their unpleasant habit of setting classifications and divisions at defiance. When glaucoma is not of the kind which I have endeavored to describe under the term chronic, it departs from this type in two directions: first, by being less regular in its course; next, by being more rapid. The tension increases, not gradually and as it were imperceptibly, but by a series of sudden increments, each of them sufficiently marked to produce a decided impression upon the visual function. This impression may be so slight as to be compared by the patient to a fog or mist; or it may amount to extinction of sight as if by a single blow. In ordinary cases, by some kind of compensation, possibly by the ocular tunics becoming accustomed to pressure against which they had at first rebelled, possibly by some reabsorption of effused fluid, or by some recovery of the deranged circulation, the obscuration of sight is only temporary; the cloud passes away, and the sight is said to be better. At the same time, any pain which may have accompanied the attack—and this pain is sometimes severe—either subsides or wholly disappears. The eyeball, in some rare cases, may even return to normal tension and to normal functional activity. But in the greater number of instances it is left preternaturally hard, with some diminution of its former acuteness of vision, and with some contraction of the field, so that it cannot include more than a very limited area without altering the direction of the gaze. At the same time, the patient often complains of iridescent rings around luminous objects; the pupil is generally a little dilated and sluggish; and the iris often appears to be pushed forwards towards the cornea. Under such circumstances, the ophthalmoscope often shows a characteristic effect of the internal pressure. Not only will there be pulsation, actual or readily induced, of the retinal vessels; but the optic disc itself is pushed backwards out of the eye, so that its naturally somewhat prominent surface is converted into an actual cup or depression. This cup is rendered conspicuous by the way in which the vessels bend around its margin. Produced more rapidly than the corresponding depression of

chronic glaucoma, it differs from the latter in being more steep-sided and abrupt; and it is readily distinguished from the condition known as physiological excavation, by the character that it extends fully up to the extreme margin of the nerve entrance, while the physiological excavation is surrounded by a ring of nerve-tissue which still occupies its proper level. The glaucomatous depression must always be regarded as affording certain evidence that the tunics of the eye have already been subjected to a very serious degree of compression and disturbance.

I have already mentioned, Mr. President, that a single glaucomatous outbreak may extinguish sight; and I need hardly say that a degree of pressure which is sufficient for this purpose must also be productive of acute pain by distension of the ocular tunics. Such cases were called by von Graefe "fulminating." They are fortunately very rare, for the time during which treatment can be usefully applied to them is so short that they are comparatively seldom brought within its reach. When seen, they should be quite unmistakable. The symptoms are intense or agonising pain, with stony hardness of the eyeball and with rapid extinction of sight. The pupil will generally be dilated and fixed, and the eye intensely congested; while the cornea soon becomes cloudy, and the media become turbid or opaque. As long as perception of light is preserved, an iridectomy may save vision; and, even when perception of light is lost, the operation may still be required for the relief of pain.

But the cases of glaucoma which have most interest for the profession generally are neither those of the fulminating variety, which are extremely rare, and in which sight is often lost before any medical aid can be procured, nor those of the simple chronic form, in which there is ample time for consultation and deliberation about the course which should be pursued. Between these two extremities of the scale we find a much larger number of examples of the subacute and acute forms of the disease, and it is with regard to these forms that serious errors of diagnosis or of treatment are most liable to be committed.

In subacute or acute glaucoma, after an uncertain duration of symptoms indicative of slight pressure, and more or less resembling those of the chronic form, the tension begins to increase irregularly, by successive sudden increments, each of them sufficient to produce more or less obscuration of vision, more or less appearance of inflammatory reaction, and more or less pain. After every such attack, or at least after the earlier ones, there is usually a more or less marked remission of symptoms and clearing of the sight; and perhaps nothing tends more directly to the neglect of proper remedial measures than this frequently recurring betterness which is not real improvement. When a careful examination is made, it becomes manifest that each attack leaves the sight somewhat worse than it was before; and, after each attack, the physical signs of the glaucomatous condition become more declared. The superficial and the retinal veins become more distended, the eyeball becomes continually harder, the pupil dilated and fixed, the disc more deeply excavated, the field of vision smaller, and central vision more dim. When the distension reaches a certain point, either suddenly or gradually, the cornea becomes steamy from disturbance of the nutrition of its surface

epithelium, or sometimes of its intimate structure; and it will then no longer be possible to examine the interior of the eye with the ophthalmoscope. It is customary to distinguish the acute cases from the subacute by saying that in the former the symptoms present no absolute remissions, while in the latter the first two or three outbreaks may be followed by apparently complete recovery; but all such distinctions are little more than endeavors to draw artificial lines where no lines exist in nature; and the epithet subacute, as applied to glaucoma, is not unlikely to be mischievous, by leading to the supposition that in the case to which it is applied there is plenty of time to spare. The very acute, and even the fulminating forms of glaucoma, are usually preceded by stages of slower progress, although these may be of such a kind as to escape superficial observation; and the most chronic form of the affection is always liable to be converted into the most rapid. The only safety for the sight is in the recognition of even chronic glaucoma as a malady in which effectual treatment is required without delay.

Notwithstanding this requirement, the experience of special ophthalmic hospitals, and of the ophthalmic departments of general hospitals, and, I may fairly add, of ophthalmic surgeons generally, is such as to leave no doubt that the character and urgency of the glaucomatous states are not always fully realised by practitioners. To whatever extent this may be true, the evil is probably in great measure due to the prevalence of specialism; for the conditions referred to are simple in their nature, and are easy of recognition when once attention has been called to them. Perhaps, however, one great stumbling-block in the way of the diffusion of sound views about these conditions has been the time-honored belief that they are essentially gouty in their character; for this belief has naturally led to the hope that a gouty condition would be relieved by the use of alkalies and of colchicum. Within the last few months I have seen two patients who have both been condemned to hopeless blindness because they were both, by different practitioners in different parts of England, recommended to abstain from seeking special advice about the daily increasing dimness of their sight until the supposed gouty pains in their eyes had first been alleviated by general treatment. Sometimes the pain of glaucoma is attributed to rheumatism, sometimes to neuralgia, and the almost self-evident proposition that it is the direct effect of tension—that is, of distension—of the ocular tunics, is comparatively seldom realised. If the notion that the eyeball was painfully distended was once fairly admitted into the mind, with the corresponding notion that the distension was at the same time producing obstruction, more or less complete according to its degree, of both the arterial and the venous circulation, I think no one could expect either to relieve the pain, or to diminish the distension, or to improve the sight, by any or all of the drugs in the Pharmacopœia. When, therefore, I see, as I see very often, cases of glaucoma which have been suffered to proceed unchecked for weeks or months, and sometimes until they have lapsed into a hopeless condition, in vain reliance upon some form of so-called general treatment, I feel that specialism, if it is indeed responsible for the want of knowledge to which such results must be attributed, owes, by way of compensation for the

mischievous it causes, a very deep debt both to the public and to the profession. There is no other part of the body in which an analogous physical change would be left to work out its effects unhindered, whilst time was being wasted by the administration of useless medicines.

Upon the question whether glaucoma is indeed a gouty affection—that is to say, whether it is, either directly or indirectly, an effect of the gouty diathesis or of the habits of life to which gout is often traceable,—I think we have hardly sufficient evidence for a positive decision. When acute glaucoma was described as arthritic posterior internal ophthalmia, complicating a chromatic change of unknown character, the glaucoma was itself accepted as a proof of its own gouty origin, and there was no more to be said on the subject. It was supposed to be as characteristic as a swollen great toe. I think we are perhaps entitled to say that gout, if it is a factor in the production of glaucoma at all, is at most only one of many possible causes of the original increase of tension, and that it may also have some influence upon the rate of further or progressive increase. A certain proportion of glaucomatous patients, although I think not a very large proportion, are persons of gouty constitution; but I have never once seen an outbreak of acute glaucoma attended by any of the general symptoms of an outbreak of acute gout; neither have I ever seen glaucoma relieved by the occurrence of gout in a regular form. It seems not unlikely, however, that the gouty habit of body may be favorable to the occurrence of increased intraocular tension; and this probability is worth remembering, so long as it does not induce us to follow some ignis fatuus as our guide to treatment. Prior to von Graefe's discovery of the oftentimes curative effect of iridectomy, and under the full therapeutic influence of the gouty hypothesis, the issue of glaucoma was always in blindness—blindness inevitable, hopeless, and complete; and the cases differed from one another only in their respective degrees of acuteness—that is to say, in the severity of each successive attack, in the degree of vision between the attacks, in the length and completeness of the remissions, and in the time which elapsed before the final result was accomplished. To a skilled observer, in those days, the commencement of the glaucomatous process meant the eventual loss of sight; and the only question for discussion was how long a time would be likely to elapse before the process was completed.

To a practised ophthalmic surgeon the aspect of glaucoma is so characteristic that I can hardly conceive the possibility of the nature of the disease being overlooked. Even in the early stages there is something in the very tint of the congestion which at once declares the nature of the case, and which leads the feeling fingers, almost instinctively, to the surface of the upper lid. But the surgeon who is not practised in ophthalmic matters too often sees only an inflamed and painful eye. The cornea is perhaps a little steamy, and the aqueous humor turbid, but the pupil, if sluggish, is dilated, and he does not think there is iritis; so he gives a purgative, perhaps followed by an anodyne, applies two or three leeches near the margin of the orbit, and prescribes sedative lotions and rest. Unless the case was originally of the hyperacute form, a remission soon

takes place, the pain decreases, and the sight improves.

It probably is not discovered, in such a case, that the eyeball is left somewhat harder than natural; and it is not thought important that the sight has not quite returned to the normal standard. After a time, longer or shorter in different cases, there is a second attack, possibly not so severe as the first, which, like the first, undergoes partial subsidence, and everybody is pleased. So the history repeats itself, until either the sight is at once extinguished by an attack more violent than its precursors, or until the patient suddenly discovers that all the successive gettings better of his eye have at last left him blind, or nearly so. He then comes to an ophthalmic specialist, who, supposing him to be at once conscientious in the discharge of his duty to his patient, and solicitous for the reputation of a professional brother, has by no means an easy task. When one eye has been destroyed by glaucoma, the other is likely either to be already suffering from an early stage of the same affection or, at least, so to suffer before long. The ophthalmic surgeon has commonly to make the patient understand that the condition of the first eye is hopeless, although it may require an operation, or even removal, for the relief of pain. He has also to make him understand that the second eye will probably be attacked in the same way; and that then a timely operation will almost certainly arrest the disease and preserve the sight. It is very difficult for a patient to realise this from verbal description, and still more difficult for him to realise it afterwards from experience, without his realising at the same time that all the pain of his former attacks, and the loss of sight which followed them, would have been spared to him if his original medical attendant had been acquainted with the nature of the condition, and had been master of the resources of his calling. The feeling of diminished confidence which can hardly fail to be thus engendered may easily extend itself to other matters, concerning which it may be wholly without foundation; and it may thus seriously affect the reputation of an otherwise skilful and careful surgeon. An excuse which I have heard made under such circumstances, "I am not an oculist," does not come with good grace from anyone who at first accepted the responsibility which he afterwards endeavors to disclaim.

The recommendation which I should like to found upon the histories of such cases is chiefly this: that every practitioner should regard the state of tension of the eyeball as something never to be forgotten or left unnoticed; and should remember that, given high tension, any great amount of improvement is a physical impossibility. It matters nothing whether the original cause of the disease was gout, or rheumatism, or neuralgia, or exposure to cold, or any of the other incidents of life to which glaucoma, like other maladies, is commonly attributed. Whatever the remote cause, the actually maintaining cause is the high tension; and as long as this high tension remains unrelieved all other treatment will only be of the smallest efficacy. In every case of apparently inflammatory eye disease, therefore, the precise morbid conditions present are of secondary importance when compared with the state of tension; and the first question of the practitioner should be: Is there here such a degree of tension as to constitute

an obstacle to recovery? The palpation of the eyeball, with reference to this question, should never be neglected; and the sound eye should in most cases be compared in this respect with that which is diseased. If these precautions were generally adopted, we should soon see no more of the embarrassing and distressing cases to which I have referred, and in which vision has been thrown away, by a vain and groundless reliance upon measures which were wholly inadequate to meet the emergency against which they were directed.

Besides the primary forms of glaucoma, there are many examples of what have been called the secondary forms of the same affection, those in which increased tension appears to have been brought about by the irritation excited by other morbid changes. There are, of course, conditions not strictly glaucomatous, in which there is a direct increase of tension; as, for instance, in serous iritis, when there is a direct and obvious hypersecretion; and again in intraocular cancer, in which the mere presence of the growth necessarily distends the eyeball. Serous iritis presents another point of resemblance to acute glaucoma, in that these two are the only apparently inflammatory affections of the internal eye in which the pupil is often somewhat dilated. The differential diagnosis is not difficult. In intraocular cancer the nature of the case would usually be quite evident before any symptoms resembling those of glaucoma were produced; and the growth is generally plainly visible. In serous iritis, the increase of fluid takes place chiefly into the anterior chamber, so that this chamber becomes distended, and the iris and lens are thrust back. In glaucoma an opposite condition exists. The increase of fluid occurs chiefly in the vitreous chamber, and hence the lens and iris are pushed forwards, so that the cavity of the anterior chamber is often nearly obliterated, the iris almost seeming to be in contact with the cornea.

There is perhaps hardly a single inflammatory affection of the eye in which an increase of intraocular tension does not sometimes occur, adding some of the symptoms of glaucoma, such as hardening of the eyeball, contraction of the field of vision, and arrest of the circulation, to those of the pre-existing malady; but such complications, very common in some affections, are comparatively rare in others. The condition most prone to produce secondary glaucoma is the presence of a large corneal cicatrix after ulceration, especially the cicatrix left by a perforating ulcer, and to which a portion of the iris is adherent. Some forms of inflammation of the cornea entail a liability to increased tension; but in all these states the patients are usually young, and their ocular tunics are more extensible than they become at a later period of life, so that impairment of vision is neither so soon nor so certainly produced. Nevertheless, if tension steadily increases, the secondary glaucoma either is, or soon becomes, of greater importance than the primary malady, and should receive the first attention of the surgeon. I have met with a few instances of primary glaucoma in early life; but in these the increasing tension has been masked by yielding of the sclerotic and elongation of the eyeball; so that cases assumed the aspect of progressive myopia, and were only recognised by the rate of increase,

and by the excavation of the optic disc which attended it.

I have already mentioned, Mr. President, that the treatment of glaucoma, from the dawn of medical history to our own time, had been utterly without effect, or that, on the most favorable supposition, it had done no more than to retard the inevitable end. Mackenzie, in 1830, recognising the importance of the distension of the ocular tunics, had suggested and practised perforation of the sclerotic; and Middlemore, five years later, followed in the same path. That their recommendations fell into oblivion is perhaps the best proof that their practice was not fruitful of results; but yet, within the last few years, it has been seriously recommended that paracentesis should be employed as an ordinary substitute for iridectomy. Soon after 1850, von Graefe, who was then only twenty-three or twenty-four years old, turned his attention to glaucoma as to a malady which was the reproach of ophthalmic surgery, and commenced a series of experiments with a view to its relief. The excavation of the optic disc, then lately rendered visible by the ophthalmoscope, had given fresh significance to the heightened tension; and the discovery of a means of diminishing tension was what von Graefe proposed to himself as the goal of his researches. He made trial of many evacuant medicines, purgatives, diuretics, diaphoretics, but all without avail. The common mydriatics, atropine, daturin, and the like, appear to diminish the tension of healthy eyes; and these were also tried without effect; von Graefe observing that their inefficacy might possibly be due to the difficulties which the hardness of the eye would place in the way of their being absorbed. The disused treatment by paracentesis was revived, and was found at the best to be productive of no more than a temporary amelioration. At last the clue was given by the observation that eyes from which a portion of iris had been excised, in order, to make an artificial pupil, or for any other reason, were often permanently softened. This observation led to experiments upon animals, and it was found that the excision of a broad piece of iris from a previously healthy eye invariably produced a state of subnormal tension. The change thus wrought was not tested by palpation alone, but also by introducing the needle of a hypodermic syringe into the anterior chamber, and by observing the height to which the aqueous humor would ascend in the barrel before the iridectomy, and again after the eye had recovered from it. The results thus obtained were sufficient to justify trials of the operation as a remedial measure upon the human subject, and in 1856 von Graefe performed his first iridectomy for the cure of glaucoma, and at once removed from the disease the burden of utter hopelessness under which it had previously lain. In 1857 his results were published to the world, and were at first met by various degrees of acceptance or of incredulity. In this country Mr. Bowman earned the gratitude alike of the profession and the public by the zeal and earnestness with which he first tested the accuracy of von Graefe's statements, and then spread abroad the glad tidings of the discovery. Nineteen years have elapsed, experience has been gained, and controversies which once raged are now wellnigh forgotten. I have not even a conjectural estimate of the number of people who

have been rescued from impending blindness by iridectomy, but it is quite certain that this number must be such as to constitute von Graefe one of the greatest benefactors to the human race that the world has ever produced.

The *modus operandi* of iridectomy, Mr. President, is too large a subject to be entered upon at the close of a discourse, and as the operation has many other uses than in glaucoma, I propose to consider it in detail on the next occasion. At present I must confine myself to its bearing upon the prognosis of the malady which is now under consideration.

Regarded from this point of view, and putting aside a few exceptional examples, whether acute or chronic, which are still found to resist treatment, we may say, as a general rule, that in the most acute cases the operation, if performed before perception of light is lost, will nearly always restore vision to the normal standard, and will prevent a recurrence of the affection. In subacute cases it will arrest the disease, but the restoration of sight will generally be only gradual, and will often ultimately be incomplete. In chronic cases the operation will usually arrest the malady, but is comparatively seldom followed by improvement; so that it cannot be relied upon to do more than preserve the amount of vision which existed when it was performed. In these chronic cases, moreover, we sometimes find that the atrophic changes which the pressure had initiated refuse to be arrested, and that blindness, after all, closes the scene. It must not be forgotten that such conditions ought not now to be suffered to exist; and that the chronic forms of glaucoma should be detected, and submitted to operation, before the atrophy has received a sufficient impulse to be continued after its exciting cause has passed away. The reliance which we justly place upon iridectomy should not on that account make us neglectful of other remedies; for treatment which by itself would be unavailing may become extremely useful as an auxiliary, when once the predominating physical condition of extreme tension has been set aside. The state of the general health, the presence of the gouty or of any other diathesis, the state of the digestion, of the sleep, and of the secretions, are all matters which should be carefully inquired into and regulated. In the great majority of instances, iridectomy alone will cure glaucoma; but there are yet some in which it fails to relieve the tension, and there are others in which the tension will recur. It is quite possible that, in both these classes, the resources of the physician might turn the scale in favor of the patient.

Besides iridectomy, there are certain alternative operations which have been proposed; but I think it will be most desirable to defer any description of these, or any examination of their respective merits, until, in my next lecture, I have described iridectomy itself, and have endeavored to find some explanation of its remedial action.

## Clinical Demonstrations

OF

## PHTHISIS.

*Delivered at the Hospital for Consumption and Diseases of the Chest, Brompton,*

By JAMES EDWARD POLLOCK, M.D., F.R.C.P.,

Senior Physician to the Hospital.

### LECTURE III.

GENTLEMEN,—When we last met I asked you to consider the differences between an acute sthenic pneumonia and phthisis, and I endeavored to make it plain to you that the peril of the latter was due, not to the extent of lung tissue invaded, but to the nature of the deposit. A limited thickening of the lung, a blocking of the alveoli by products—inflammatory or otherwise—which will not disintegrate and resolve, is a phthisis which destroys the alveolar walls and causes their collapse; whereas a pneumonia affecting even the whole of one lung may clear up and leave it unimpaired in all its functions. I will to-day consider the three stages of consumption, and examine our means of recognising them in practice, and ask your attention to the various progress and termination of cases according to their stage, and especially how localisation of the morbid product influences the issue.

The *first stage*, which consists in a filling up of the alveoli by inflammatory or tubercular products, is recognisable by the signs which indicate altered physical conditions of a portion of the lung. In health we hear the gentle vesicular murmur caused by the entering air, followed by an equally gentle expiration-sound as the air is expelled, and the percussion-note is even on both sides. The voice scarcely resounds through the elastic air-tubes, but communicates a gentle purr or fremitus to the hand when applied to the chest-walls. But if a portion of lung be solidified surrounding a pervious air-tube all this is altered. There is a dull note on percussion, because less air is under the finger. The entering air-sound may be *feeble, harsh, or jerky* and interrupted; the expiration-sound is prolonged unduly; while the voice-sounds are propagated to the ear as through a tube, and the heart's sounds are also conducted. Now these are common to the first stage of phthisis, but why? All that auscultation can tell you is that a portion of the lung has several of its physical conditions altered, but of the nature of the product which so alters them it can tell you nothing. That knowledge can only come to you by a study of the other relations of your case. Let us try these alterations by their meaning.

*Feeble respiration* may be due to obstruction in one or more bronchioles, by pressure on their walls or narrowing of their calibre; by any obstacle to air entering, as a tumour or a foreign body in the bronchus; by anything which increases the distance of the lung from the ear, as effusion into the pleura or by a thickened pleura; and by emphysema which impairs the elasticity of the lung.

*Harsh* breath-sounds may be due to thickening



of the walls of the air-cells, whereby their elasticity is impaired, by induration causing pressure on the alveoli, and by dryness of the mucous membrane of the bronchi.

*Prolonged expiration* depends on a difference in the density and an alteration in the elasticity of the lung, whereby a sound naturally feeble is developed and rendered more audible.

The *bronchial* or *tubular* character of the breath-sounds and voice is caused by the increased conducting power of the solidified lung, and excessive audibility of the heart-sounds means the same.

The *wavy* or *interrupted* inspiration-sound is only valuable when permanent and conjoined with other sounds which indicate solidification, as a whiffy or tubular character of breathing. It is probably caused by alterations in the elasticity of the alveoli and their irregular expansion.

Now, if you can group several of these signs in any one case, and if dulness coexist and the space presenting these phenomena be limited in extent and one-sided, you may be sure that some solidifying alteration has taken place in and around the alveoli of that part of the lung. But if this condition be preceded by slight loss of flesh, subfebrile symptoms, and with dry cough or a scanty flocculent expectoration, you may be pretty sure that you are dealing with the early stage of phthisis. But do not be in a hurry to condemn your patient. You only know his present state, and the future is masked, or may be altered by various other agents than those now evident to you. This was the mistake of the early stethoscopists, who thus often brought an invaluable discovery into undeserved disrepute. Physical evidence is always true, but the inferences may not always be correct. I have pointed out to you that even from this state of things there may be recovery; the alveoli may collapse, the chest-walls fall in, the morbid product in the lung undergo degenerative change, dry up, and be expectorated, and a little flattening and dulness alone betray the nature of the attack.

I show you here the vertebra of a rabbit which a young lady got impacted in her right bronchus, where it remained for eighteen months, giving rise to all these physical signs, and also to the hectic and wasting of phthisis, as well as to hæmoptysis. But one day she expectorated the bone which I produce, and all her symptoms ceased. I yesterday examined her: it is now four years since the accident, and she has a flattened spot under the right clavicle, with high-pitched, almost whistling inspiratory sound, long expiration, dulness, &c.; and no doubt there is a damaged piece of lung here, collapsed and contracted; but she need not fear a relapse of her symptoms, for the cause is removed. And so of the block of the lung in phthisis: it often happens that there is no recurrence of the local disease or symptoms, if the indispensable condition be also present, that there be no renewal of the constitutional disorder which preceded and probably caused the attack on the lung.

It is pretty evident, then, that a *first stage* of deposit in the lung may remain quiescent for an indefinite period, and I have had such under my notice again and again for fifteen or twenty years.

The breaking up of such deposit—its degeneration, that is, fatty or caseous,—constitutes the ordinary *second stage* of phthisis. If this pro-

cess be limited to the inflammatory or tuberculous products in a small portion of the lung, it is, although often attended by much hectic and wasting, a step in the disease which may be so defined and so little involve surrounding portions of the lung that the symptoms may subside, the foreign matter be cleared out of the alveoli, and only a damaged spot remain, in which doubtless the alveolar walls have been destroyed, and collapse has necessarily occurred. In this portion of pulmonary space may be found any of the degenerated results of inflammation or tubercle, caseous, calcareous, or fatty. While this breaking up is advancing a moist crepitus of more or less large bubbles is characteristic of the change, but the signs of cavity—that is, of a more or less large excavation—are wanting. The conditions causing solidification are reduced, and the voice is no longer bronchial, nor the breath-sound tubular, but a certain amount of dulness remains. It is a state in which air enters more freely than in the previous stage, but all purely vesicular breathing is permanently lost; for you have compressed, broken-down alveoli, infiltrated products in and around them, the elasticity of the lung gone, and the bronchioles conduct the entering air into a disorganised structure with semifluid contents. From these altered mechanical conditions we can readily understand the moist crepitant sound characteristic of the lesion.

But supposing the local disease to be retrogressive, and not involving, by fresh inflammatory or other deposits, an increased number of alveoli, we have then new and interesting conditions. The softening or fluidifying degenerative changes have ceased. Some part of the alveolar block has been removed, but some remains, and it is mixed with the debris of the injured structures. The fibrous changes also, of which I shall have occasion to speak more in detail, now begin to come into play; and a proliferation of the fibrous, interlobular, and pleural elements binds together, and even begins to wall in and compress, the altered lung-tissues. Should the purely degenerative changes undergo arrest, and a more or less dry residual caseous or calcareous matter represent the former morbid product, we have a state of things which physically accounts for the altered sounds. The *moist crepitus* becomes a *dry crackle*, and you have just seen out of what materials the sound is made. At the same time the chest-walls flatten, their movements are manifestly limited over a more or less large surface, and of course the dull percussion note remains—nay, becomes intensified,—for the tissues underneath have been rendered more solid and condensed. At this time your patient gets better; he coughs less, loses the night-sweats, and recovers flesh and strength. From these altered conditions of the system and of the physical signs we may see at once the importance of the cessation of all inflammatory action in phthisis. Inflammation is perhaps the most destructive of the agents which break up the lung, and, if congestions be absent, a period of tolerance is very commonly arrived at, during which reparative changes immediately begin. Thus in practice you will find that a great deal of the crepitant rhonchus which is commonly attributed to the presence of softening tubercle may disappear under treatment adapted to relieve congestion—being, in fact, due to inflammatory exudations which are capable of resolution and removal. I would have you notice

that softening or ulcerative changes in the lung commonly begin at the back part of the apex, so that the characteristic sounds of moist crepitation will often be found in the supra-spinous fossa, although absent in the subclavian region. As regards the numerical frequency of the chronic quiescent second-stage cases, I made notes of 203 which had lasted for sixty-seven months, and at the end of that period 132 were still in a stationary condition.

I must detain you here to point your attention to a form of chronic disease exhibiting the physical signs of the second stage of phthisis, which I believe I was the first to describe; and I have named it the *chronic diffused* form of phthisis, this expression having relation to the localisation of disease in the lung. It forms an important variety of the disease, especially as regards the prognosis, for I have been rarely deceived when assigning a considerable chronicity to cases of this class, and a fair number of them are always to be seen in our wards. The subjects of this variety of disease present on the whole a favorable aspect and history. They are commonly men (2½ males to 1 female), of large, well-made chest, and without hereditary tendency to phthisis; the age between thirty and fifty. They are the subjects of cough and expectoration, with occasional hæmoptysis. The emaciation has been progressive up to a certain point, but stops short of excessive waste. The febrile attacks are not severe nor prolonged, and the temperature soon falls to a normal standard. On examining the chest, you are struck with its good development and fair measurements, especially as contrasted with the narrow flat chest and high shoulders of the typical forms of phthisis; nor are the scapulæ alar. The movements are but slightly impaired, although a careful observation will detect lessened expansion over a large area of one side. It is commonly unilateral, but not invariably so. The percussion note is moderately dull over a like large space, not absolutely dull over a small part of one apex. Here a diffused, more or less moist crepitus is heard, increased by cough; and you are surprised at the extent over which the physical signs are spread. The patient's chief complaint is of dyspnoea. These cases very rarely indeed go on to the stage of cavity, and are free from the chances of pneumothorax. Pleuritic effusion is also an uncommon event in their course.

I believe their pathology to be that they are examples of a deposit spread over the surface of the lung rather than massed on one spot, and hence their non-liability to form cavity. The alveoli of a large surface tract of lung are no doubt impacted, but the inflammatory exudations which in ordinary phthisis form the connexions between groups of damaged alveoli, are not present; and thus, when degenerative softening changes take place, a large superficies of lung is affected, but the burrowing destructive ulcerations by which the depths of a lung are broken up do not occur, for much healthy vesicular structure underlies the diseased surface. For this reason also the movements of the chest are little impaired, and, as fibrous changes are not undergone till a late period in the history of the case, we find neither retraction of the chest-walls nor the displacement of the heart and of the opposite lung so commonly observed in the latter form of phthisis. The character of the crepitation is rather dry than hurried, and pleural friction-

sounds are not uncommon. Patches of tubular breath-sounds may be occasionally observed, commonly near the middle of the lung, but they are limited in extent, and generally clear up. The opposite lung becomes affected in a large proportion of these cases, but the extension is slow, and the symptoms are subacute. I have carefully noted 149 examples of this form of disease, in 133 of which the second lung ultimately became diseased, but with a like diffused form of deposit. The larger number lived for long, indefinite periods, often for years. The invasion of the disease had commonly been insidious, but was occasionally acute, the patient subsiding into the chronic condition I have been describing. Their termination is generally due to intercurrent pneumonia, and they do not end with hectic and diarrhoea, like ordinary phthisis. I think there is little doubt that the rheumatic constitution tends to this form of disease. Out of 146 of my cases, either heart disease or rheumatic fever had existed in 86, or about one-fourth of the whole.

In offering an opinion, then, on a case presenting the characters of large chest with the signs of diffused deposit over a considerable space of one lung, febrile symptoms being in abeyance, and the case already chronic, with but moderate waste of flesh and unimpaired digestion, you will be safe in giving a favorable prognosis as to time. While knowing the liabilities of this peculiar variety, you can be both forewarned and forearmed against the attacks of pneumonic congestion which are likely to occur. In this class of cases you have an instance of the *localisation* of the diseased product affecting the character of the affection and the result; just as I said, in describing the first stage, that the *nature* of the deposit blocking the alveoli was of more importance than its extent.

Now the *third stage* of phthisis (or excavation) derives its characters and bears an import from these two same features—the *nature* and *localisation* and extent of the inflammatory or tubercular product in the lung. Sometimes rapid disintegration occurs and large quantities of matter are thrown up, the patient suffering extreme hectic and emaciation. If this be the breaking up of a dense mass of solid lung at the apex (a catarrhal pneumonia), a cavity is rapidly formed, and while this process is actually going on you can say little as to the result. The danger is not in the rapidity of the degenerative process, which melts up all the tissues of the lung, but in its extent. If there have been solidified, blocked masses of pulmonary tissue in two or three parts of the same lung, and if these become connected by inflammatory infiltration, and under a continuous ulceration, you will have a large, irregular, burrowing, anfractuous cavity, the ulcerative process extending from above downwards, so that almost the whole lung is destroyed. Often enough, during the destructive process, either from secondary poisoning, or from an extension of the constitutional disorder affecting the second as it originated the disease in the first lung, you will detect moist sounds on the opposite side, with continuous extension downwards. These are cases of rapid “galloping” consumption. They leave us no power, and the patient sinks.

But there is another form, where the disease is limited to one apex and stops there. And when the disintegrative softening occurs, a mass of solidified lung is cleared out and a cavity formed—

at great cost, it is true, to the patient; but if the disease is isolated, and the remainder of the lung is sound, you may have what is called a *limited cavity*, and the patient may recover a very fair amount of health.

The progress of softening and clearing out of the diseased mass is generally very rapid and the hectic extreme; but if you can ascertain that the subjacent parts of the lung are sound, and that extension from the apex downwards is not taking place, you may await the result with patience, and even with hope. When the cavity is well formed expectoration gradually lessens, while the febrile symptoms subside. Immediately below such a cavity the lung is consolidated, and in this spot you have a favorable opportunity of studying the physical signs of the first stage—that is of blocked alveoli. 'The more defined the signs of cavity the better; nor is its size apparently of great importance, for it is amazing how large an extent of lung may be lost provided there be not an extension of morbid action around it, and yet the patient recover health. In Prince of Wales's ward you have an admirable example of this variety of cavity. C. C—, clerk, aged fifty-three; no hereditary tendency to chest disease. Is one of nine brothers and sisters all living. One year ago he was attacked with cough and severe fever, accompanied by copious sweating. He then had abundant fetid expectoration for eight weeks. In August he was an inmate of St. Thomas's Hospital, where he recovered so far that cough and expectoration ceased altogether, and sweatings, &c., stopped. He partially recovered weight, and is now 8 st. 3 lb. At present he has only morning cough, and slight expectoration, occasionally tinged with blood. He has but little dyspnoea; sleeps well; digestion fair; temperature normal. The right chest is dull and flattened to the third rib. Over this space there are cavernous blowing and pectoriloquy, with occasional distant humid crepitus. Below this the breath-sounds are deficient; the base is slightly dull. Posteriorly there is loud, dry, cavernous blowing, and well-marked pectoriloquy over the upper fourth of the lung. The rest clear. The left lung reaches to right margin of the sternum. Since he entered the hospital he has steadily recovered health and strength, and improved in weight. He scarcely expectorates.

As time goes on in these cases the heart is drawn to the affected side, and often is found to the right of the right nipple; the liver and diaphragm become drawn up, and the chest-walls retract considerably. They are more common on the right side, and more favorable. In sixty-eight cases under my care, two-thirds being males, fifty were on the right side and eighteen on the left. Six only had hereditary taint. Thirty-five presented absolutely dry signs. In seventeen only were there signs of incipient disease in the opposite lung, and in one only was there crepitation in the other lung. Fifty-five out of the sixty-eight had improved on leaving the hospital. Dr. Bennett has recorded eighteen cases with like conditions. Nine had the right lung affected, and only three were females.

My observations give to this class of cases a duration of life *double that of the ordinary forms of phthisis*, and I have watched some of them for twenty years. As regards the frequency of their occurrence, I had 68 circumscribed cavities out of 4530 cases of phthisis. Their much

more frequent localisation in the right side has, perhaps, some relation to the division of that lung into three lobes. You will also remember that the right bronchus is shorter, more open, and allows the contents of a cavity to be more freely emptied. There is something in this; for the most intractable cases of cavity I have seen are those deep seated in the lung, with long, probably fistulous, communications with bronchial tubes of any size. You will remark of the limited cavity that it surely but slowly undergoes retraction, and in so doing it is assisted by those fibroid changes of which I shall speak to you at our next lecture. It is lined and walled in by fibroid tissue. Often you will find thick bands consisting of this natural mode of contracting and obliterating the vessels of the lung passing across it. The pleura is thickened around the excavation, and sends prolongations of fibrous tissue through the lung. The chest-walls fall in, the other chest organs are drawn up to fill the lessened pulmonary space, and nature is evidently attempting to close and heal up the cavity. Does it ever heal? Certainly it does, of which we have seen here many examples, and in your post-mortem examinations you will daily see cicatrices of the lung. I have myself watched the formation of a large cavity in the right lung, and now, at the end of ten years, there is no sign of excavation, but a flattened retracted side and deficient breath-sounds only, while the health has perfectly recovered. But it is far more important that you should recognise, and be able to offer the great help of a favorable opinion to a large number of individuals with limited cavity than that you should remain dissatisfied because you cannot demonstrate during life the occurrence of cicatrisation in the lung. It is a very long step towards a cure of consumption when your patient ceases to expectorate, and regains flesh and vigor. Time was when such cases were condemned lives—"last stage of all, cavity!" And, surely, it is a great advance to have recognised that in such instances nature is daily and hourly advancing towards a cure, even if she never arrives there, instead of descending lower and lower in the progressive steps of ulcerative disease of the lung.

I will sum up what I have to say to-day by a short statement of the *dangers* and of the *prognosis* in cases of cavity in the lung.

The two great dangers are *hæmoptysis* and *pneumothorax*, or such a perforation of the lung as permits the escape of air into the pleura. Each of these events, grave in themselves, and the results, we shall consider on another occasion; but to-day I would impress on you that the dangers in cavity are mechanical rather than vital. The hæmorrhage is due almost always to aneurism of a small branch of the pulmonary artery, often from the side of the vessel which is exposed, and therefore not supported by surrounding tissues. Such bleedings are passive, and not congestive, as in cases of pulmonary apoplexy, pneumonia, and the like. The pipe is broken, and out rushes the blood. I have told you how nature protects herself against such an accident by increase of the fibrous tissue of the lung, which surrounds, compresses, and often strangles the exposed vessels. But sometimes a minute's dilatation occurs in an unprotected point, and hence the hæmorrhage, which is often so rapid as to be fatal in a few minutes. The other danger in cavity is of a like nature. Air escapes instead of blood, through a

minute opening in the pleura, and you have a pneumothorax. If these fibrous changes which involve the pleura are not perfected, the strain of severe coughing, or even of movement of the arm, may produce the rupture. This is also a very serious lesion, for with each expiration a fresh quantity of air is forced into the pleural cavity, the lung is compressed and forced to collapse unless it be tied down by adhesions, and the sudden loss of respiratory space is sometimes so great as to cause death within a few hours. These are the two grave accidents to which the subjects of cavity are liable, and of course you will see at a glance that if the excavation in the lung be perfect, the surrounding tissues condensed by fibrous proliferation, and a tough lining membrane be furnished from the same source, the liability to either event is infinitely lessened and the patient may live secure.

There are other dangers of a less degree which should be stated. An ordinary bronchial attack may affect the extensive secreting surface of the excavation, the patient may take cold in the cavity, and profuse secretion is set up; but only for a time, and this will yield to appropriate remedies and rest. It is one reason for advising a temperate climate for such cases, and undoubtedly they do best when so cared for.

For the reasons I have stated these limited cavities do not often end by breaking up the lung surrounding them. They are walled in by thickened pleura and tough lining membrane and fibrous bands of tissue around the air- and bloodvessels. Direct extension is, therefore, not one of their dangers. If the disease be lit up afresh, you must look in the apex of the opposite lung for it, or in the base of the same lung, or occasionally, as I long ago pointed out, in a *diagonal* direction to the base of the opposite lung. That which is worth remembering now, however, is that they do not often extend directly by destruction of the lung-tissue immediately surrounding.

Let us just review the elements for prognosis in these various forms of phthisis of the ordinary chronic kind. Continuous progressive phthisis owes its destructive character to the *nature* and *extent* of the deposits in the lung. Inflammatory or tuberculous products, prone to rapid degenerative change, scattered through the lung almost in continuity, are of necessity fraught with the highest danger; for in the stage of softening all the pulmonary tissues are involved, and the patient is exhausted by irritative fever before any of the protective fibrous changes can be set up.

If the deposit in the lung be limited in extent, unaccompanied by inflammatory exudations, and of a nature to resolve or undergo degenerative changes of the calcareous nature you may have chronic phthisis, first stage, with but moderate damage to health. In the stage of softening, if the disease be limited in extent, and the changes be of the drying character, with absence of congestions around the deposit, a long pause may occur after the severe symptoms which generally usher in this stage.

In the *diffused* deposit in the lung spread over a large surface, with extensive but superficial physical signs, occurring in individuals of large chest, and from the fair movements and absence of great retraction of chest-walls, evidently not involving the deeper tissues of the lung, you have good reason for assigning a long term to the cases.

But in this, and in all forms of phthisis, irritative fever should be absent before you enter on a favorable prognosis, for hectic means inflammatory action and exudations prone to destructive changes, and is the most formidable agent we have to combat in phthisis.

Should the stage of *cavity* be reached, you will remember that a well-defined limited cavity, with physical conditions well marked and the signs unmistakable, is much more favorable than an irregular, ill-defined, burrowing series of excavations, with a limit hard to define, but where cavernous sounds shade off into humid crepitant rhonchus, down perhaps to the base of the lung. For the latter condition means a lung much infiltrated with morbid products in various stages of disintegration, and the character of *limit* is wanting. Here you will observe the important part which fibrous changes play in phthisis, for they bind down and circumscribe disease and stop extension. In the last stage of phthisis, when no vesicular lung remains, you will find that all which is left to represent lung in the post-mortem room is fibrous tissue. The well-defined cavity, however large, may be regarded with less apprehension. It has its dangers, as I have pointed out; but when excavation is accomplished there is generally a long pause, often a great recovery. It is an achieved event in which disease has done its worst; and if the remaining parts of the lung are sound, and fever has ceased, the patient may live for years in comparative safety. The best forms of such cases occur in the male sex, and on the right side; and, in estimating their chances, pay minute attention to the absence of the signs of extending disease, and to the perfection of the insulation of that which exists.

## Original Papers.

### THE SPHYGMOGRAPH IN MEDICINE.

OBSERVATIONS ON THE TRACINGS FURNISHED BY  
MANY CASES OF DOUBLE AORTIC MURMUR.

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THE familiar comparisons by which the pulse of aortic regurgitation is described, as appreciated by the finger, prepare us to obtain such tracings as are given by Dr. Burdon-Sanderson (Fig. 6, p. 73, "Handbook of the Sphygmograph"; and Dr. Galabin, Fig. 5, *Journal of Anatomy and Physiology*, vol. x., p. 318). These were taken from patients who had free aortic regurgitation. But very little experience soon shows us that such tracings are rather exceptional even in cases where there can be no doubt about the diagnosis. It is far more ordinary to obtain tracings in which tension-signs are very prominent, and which are more indicative of morbus Brightii than of morbus Corriganii. It is true that by varying the spring pressure we may at length succeed in obtaining tracings more or less corresponding to the typical form, but unless my experience is very misleading,

there can be no question that flat tops and delayed tidal waves are far more frequent in the condition in question than in any others, excepting those of positive arterial degeneration or morbus Brightii. Lorain's figures show that he has observed this point; many of them might well stand for the tracings of very high tension pulses (*vide* 840, 843, 849). To explain how it comes that the tracings of a pulse, reputed commonly as "collapsed" and "empty," so often resemble that of a rigid artery seems no easy matter. Perhaps, however, the following considerations may help towards the solution of the difficulty. In the cases of double aortic murmur commonly met with there exists more or less obstruction to the entrance of blood into the artery, as well as more or less regurgitation from the artery into the ventricle. The obstruction is encountered by the hypertrophied left ventricle, which, in the majority of cases, acts powerfully, and drives so large and so forcible a wave of blood as to cause considerable distension of the larger vessels. The regurgitation is produced by the elastic resilience of the walls of the larger arteries. It would be equal in force and effect to the flow of the systole, were it not that an open channel exists towards the capillaries, by which by far the larger part of the blood expelled by the ventricle undoubtedly escapes. A certain quantity, however, is returned into the ventricle by the contraction of the elastic arterial walls, and by its pressure upon the sides of the chamber dilatation and hypertrophy are induced. The pressure thus exercised must be much greater than the normal, which is little more than that produced by gravity; whereas that of the regurgitating blood equals that of gravity *plus* that of the arterial systole. This distending force must operate as a powerful stimulus to the next contraction, so that the ventricle is continually kept in a state of over-excitation. This forcible systole, together with the larger charge of blood impelled into the aorta, must cause undue distension of the arteries, which is evidenced by their enlargement, their violent pulsation, and sometimes by their tortuousness, even in the young.

It is further to be considered that if the lesion be such as to make the amount of obstruction considerable, it will *pro tanto* lessen that of regurgitation, and so the effect on the tracing will be to assimilate it more or less to that of pure obstruction. This, as far as I have had opportunity to observe yet, is characterised by a low rise and a top either flat or sloping upwards—a tracing eminently indicative of tension. This will necessarily be so, for the systole of the ventricle which has to overcome any notable amount of obstruction at the aortic orifice must be more gradual or prolonged than that of one which meets no resistance. In consequence of this the amount of arterial distension will be lessened, but the period during which it continues will be lengthened (*vide* Case 7 tracing). In cases, therefore, where systolic murmur is heard in the neck and at midsternum, but diastolic murmur is absent above the sternum, it is very probable that the tracing will present more the features of tension than of sudden arterial collapse.

Of course, if any obstruction exist in the arterioles or capillaries, such as we must believe to have been present in Case 1, the signs of arterial distension will be rendered still more apparent. It is worth remarking, as showing the tendency even

in free aortic regurgitation to the production of tension signs, that in both the typical tracings referred to above—viz., those given by Sanderson and Galabin—there is a distinct predicrotic notch, such as would not exist in a normal tracing.

CASE 1. *Double aortic murmur; anasarca; pulmonary apoplexy;—at autopsy, aortic valves tolerably healthy; aorta much dilated and very atheromatous; kidneys tolerably sound.*—G. G—, aged forty-nine, male, admitted April 19th, 1876. Has been out of health five or six months, his chest has been weak, and he has had cough three or four years. He got fresh catarrh three months ago; has not been able to work since; both legs are very much swollen. Pulse 100, feels full, large, jerky. Loud double murmur at midsternum and xiphoid and at upper sternum; loud diastolic murmur at nipple-line in fifth space; breath markedly of urinous fetor. Temperature 98°. Lies down well; urine not albuminous probably, but this is open to question. Compound jalap powder every morning; mixture containing citrate of potash and five grains of nitrate of potash three times a day; warm bath in the evening.

April 20th.—Breathing very feeble in both backs, especially at lower parts; much mucous r le in upper, less marked in lower; has spit up some small masses of blood; face pale. Had an attack of semi-syncope this morning; a second occurred during the visit. His pulse immediately before seemed good and full, but while sitting up to be examined it became very small and weak, and his countenance indicated impending syncope. He was laid down and brandy given, and he rallied completely, but in the night another attack came on, and he died at 1.15 A.M. of the 21st.

*Post-mortem examination.*—A large amount of turbid yellow serum in the right pleural cavity. Right lung contained at apex a block of pulmonary apoplexy, well circumscribed, as large as a walnut or rather larger; the rest of this lung was cedematous. Left lung tolerably healthy; at its apex there was a mass of old cretaceous tubercle, of the size of a pea, enclosed in a thick envelope of fibroid tissue; there was also cretaceous matter in the bronchial glands, but no milary tubercle anywhere. The heart was enlarged, and weighed 24½ oz.; its muscular tissue was of a good red color, and showed no sign of fatty degeneration. The right cavities were full of black clot; the valves healthy. The left valves also were tolerably efficient; the sigmoid retained water poured over them pretty well; and the mitral were not much altered, nor was the orifice dilated. The aorta was very much dilated at its origin, and in all its thoracic extent; at one part, a little below the termination of the arch, its posterior outer wall was bulged considerably, forming a sort of elongated sacculus, the interior of which was lined with a deposit of pigmented fibrine. The coats of the aorta were highly atheromatous (endarteritis deformans). The liver weighed 61 oz., was highly nutmeggy and fatty. The kidneys looked small; lobulated; surface after removal of capsule slightly granular; each weighed 4½ oz. The renal tubes were not broken up, but were often much infarcted with granular fatty epithelium. The spleen was rather small, and dark; weighed 6½ oz.

The arterioles of the subcutaneous tissue of the calf appeared, under the microscope, to have thick-

ened walls, and sometimes to have a dense outer fibrous investment; thickened adventitia. I could not, however, feel certain whether the majority of them were merely contracted or actually sclerosed.

In this case it seems to me a matter of certainty that the heart had contended against obstruction in the arterioles until it was exhausted, and finally succumbed. The general dilatation of the aorta and the incipient aneurism are proofs of the existence of abnormal pressure in the arteries. The aortic regurgitant murmur was evidently not dependent on destruction of the valves, but on dilatation of the orifice, so that the flaps were unable to close it. The diastolic murmur heard at the fifth space must have been generated at the aortic orifice, and conveyed to the apex. The information respecting the urine is unfortunately defective; it is most probable that it was not albuminous, but even so the existence of uræmia is not thereby disproved, especially as the breath had decidedly a urinous fætor. The autopsy showed that the kidneys were not in an advanced stage of disease, but still they could not be pronounced quite healthy by any means. The cause of the obstruction of the arterioles or capillaries was not clearly revealed by microscopic examination, but that such a condition did exist there can be no question. It is unfortunate that I had not time to take a tracing, but no one can doubt what its form would have been, especially as this deficiency is in a measure supplied by the other parallel cases. Dr. Gordon speaks of cases of this kind being familiar to Dublin observers.\* In London they are hardly so frequent I think, as, out of five hospital physicians whom I questioned, only two remembered to have seen such.

**CASE 2. Double aortic murmur; pulsation at sternal notch; weak breathing in right back; no dropsy; flat topped tracing.**—J. W—, female, aged forty, admitted November 19th, 1876. Had been ailing two years, suffering with indigestion badly; had copious hæmatemesis a year ago, and has been bringing up smaller quantities (streaks) very often; has lost much flesh, and is thin; has much pain after food, mostly at left side of abdomen, and tenderness at left hypochondrium and epigastrium; tongue clean; bowels very costive, but open yesterday; catamenia are scanty, and occur irregularly; legs and feet never swell; does not always sleep well; breath short on exertion; lies down well now, but can't always; breathing in back quiet and weak; it was subsequently distinctly ascertained to be permanently

markedly flat-topped, the rise was high. At the apex in the fifth space there was a systolic murmur, and on the left side the same followed immediately by another less loud and long, which was not synchronous with the carotid impulse, like the first. At the mid-sternum and xiphoid there was a loud double murmur, both divisions of about the same length; this murmur was heard less loud at both second cartilages. A thrill was felt in the second and third right spaces. The apex beat was in the fifth space, just outside the vertical line. The murmurs heard in the left side became gradually louder, as they were traced upwards from that side to mid-sternum. The right chest front was notably more arched (bombed) than the left, but was resonant. The right chest measured 16½ in., the left 15½ in. The urine was pale, sp. gr. 1011, not albuminous; deposited a moderate sediment of epithelial scales or mucous corpuscles; no renal epithelium or casts. Nearly three weeks later it deposited a notable amount of uric acid, with mucus or pus corpuscles, forming a sediment of some magnitude. My last note was made Dec. 2nd, when the pulsation of the aortic arch was felt very markedly at the sternal notch; the finger seemed to touch the artery; the urine still deposited uric acid. She took muratic acid and tannin, with some benefit to her gastric disorder; nothing else.

The marked aortic pulsation at the sternal notch, the character of the radial pulse, and the flat-topped tracing were not easy to reconcile with the existence of a well-pronounced regurgitant aortic murmur, supposing the latter to depend on partial disintegration of the valves. The urine gave no evidence of renal disease, there was no dropsy, and there was therefore no apparent cause for the existence of arterial tension in excess. Still the evidence of the tracing was positive, and it was constant. The lessened breathing on the right side might be attributed to the presence of an aneurism of the arch on the right bronchus, and this was a possible result of increased arterial tension. I could not harmonise the phenomena for want of a due appreciation of the modifying effect of the obstruction on the aortic regurgitation, and so the case remained for a while obscure.

**CASE 3. Rheumatic fever three months ago; double aortic murmur; rhythm of heart irregular; marked aortic pulsation at sternal notch; no albuminuria; no dropsy; flat-topped tracing.**—C. C—, aged seventeen, female, engaged in a laundry; admitted on May 3rd, 1876. Parents both alive and in good health. Has five brothers and two sisters, who are also well. Lives near Kensal green. About three months ago she had rheumatic fever badly, and since that time she has been troubled with shortness of breath and palpitation of the heart, and has soon become tired after any exertion. Complexion fair; skin moist; perspires very freely in the axillæ and feet; tongue clean. Pulse feels somewhat hard and jerky; is just visible in both wrists. Urine: specific gravity 1020; not albuminous; copious. Temperature normal. Heart's impulse felt at fifth space, a little inside vertical nipple line, also at xiphoid. Impulse is also evident at left second space, close to sternum, and is very evident to the finger at the sternal notch. Heart's rhythm irregular, the orderly succession of beats being interrupted frequently by hurried brief contractions. A systolic murmur is heard at left

more free and full in left back than in right, and the resonance in the left was better also. Pulse 88, hardish, of fair force, compressed by 220 grammes; the radial tracing in both wrists was

\* Vide Dublin Quarterly Journal of Medical Science, 1865, vol. i., p. 98.

side, a double one at mid-sternum and right second cartilage, a loud rough systolic blowing at right neck, and same less loud at left. The systolic murmur in the left side is replaced during the hurried beats by a sharp, loud tension sound. Lungs are fairly free. Tracing taken on May 5th is very markedly flat-topped with pressure 50; shows a higher rise with pressure 28; is peaked with a

more room for expansion in the first and less in the second. There was not much hypertrophy of

shoulder with pressure 0. The impulse at second left space is well marked during expiration, but is hardly seen during inspiration. Appetite bad. Simple diet, beef-tea, milk, eggs, and four ounces of port wine ordered; also a mixture of fifteen minims of solution of muriate of iron and fifteen minims of spirit of chloroform, to an ounce of water, three times a day.

May 8th.—Is a little better. Rhythm of heart less irregular; sounds as before.

She improved so much that she was able to walk up and down the lofty flight of stairs leading from the ground-floor to the first-floor fairly well, and went out about the end of May. She soon, however, lost ground again.

Numerous tracings were taken in this instance with pressures varying from 0 to 56, but all showed more or less indication of undue arterial pressure. The effect of posture of the arm was very marked, elevation rendering the rise high and deepening

the predicrotic notch, depression lowering the rise and converting the notch into a nearly flat shoulder. The height of the rise is evidently dependent on

the amount of arterial expansion, as, indeed, I believe it always or almost always is, and is therefore necessarily greatest, *ceteris paribus*, when the artery is emptiest just before its diastole.

Elevation promotes emptying of the vessels, and hanging the arm down repletion, so that there is

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blood, while gradually a new womb is reconstructed upon the original pattern. Uterine involution should partake of the slowness, the steadiness, and the painlessness of chemico-vital processes, and instead of being promoted, it is interfered with by the pains, the spasms and cramps of the puerperal womb. This normal rate of involution may be exchanged for one so rapid that Schroeder has seen it set up fever, and powerful enough to remove most of the muscular tissue, so that the walls of the womb were found no thicker than those of the intestine. This *super-involution* of the womb is so rare that I have not met with it, whereas *defective uterine involution*, or *sub-involution*, is of frequent occurrence, and the object of this communication is to show how it originates and fosters uterine diseases.

The time allowed to uterine involution should be understood as dividing itself into two periods. At first there is a rapid decrease in the size of the womb, although during the first few days after labor there be no parallel decrease of weight. This period may be roughly estimated at a fortnight, during which defective involution is caused by the serious diseases that obstetricians have then to contend with; and they also know this defective involution as a cause of post-partum flooding, and of that absorption of putrid matter which leads to puerperal lymphangitis and phlebitis. To this period I refer the cases that have chiefly struck Dr. Arthur Farre, who describes "involution as arrested without inflammatory action, so that the uterus remains undiminished in bulk, its fibre uncontracted, and its tissues unrenovated for several weeks or months after labour, the soft flabby organ being easily felt above the pubes, reaching sometimes as high as the umbilicus; while its cavity, tested by the uterine sound, may measure several inches in depth."\* I have only met the womb as thus described during the first fortnight of puerperality. After that, and more particularly after menstruation has occurred, it is gathered up into a more or less consistent and enlarged ovoid. Some of the causes that interrupt involution in this first period do so in the second period, which may be said to extend over six weeks. I have already mentioned premature labour as a cause of defective involution; the undue prolongation of labor is a much more potent cause. My assertions as to this have been confirmed by Dr. Goodall† and by Dr. Serdukoff. Involution proceeds at a slower rate in oldish women and in those confined during the last decade of reproductive life. Every variety of puerperal fever checks uterine involution, even if the womb be not faulty. Any kind of uterine inflammation checks uterine or peri-uterine involution, and the check is proportionate to the extent of the disease. Lastly, defective involution may occur without apparent cause, and is then to be attributed to something wrong in the innervation of the womb, or to an all-pervading general state of debility.

Debility should be the first thought of the practitioner, as a frequent cause of defective involution, for the early exhibition of some preparation of iron often visibly improves the appearance of the patient, and by dispelling uterine congestion it promotes involution. When, however, strength does not follow the use of tonics, and when, a

few weeks after delivery, the patient complains of bearing-down sensations, pelvic distress, and mucopurulent or bloody discharges, their cause should be ascertained by a carefully made examination. If, on the contrary, the beginnings of uterine disease are overlooked, they take root in an imperfectly involuted womb, and the patient is likely to become a confirmed invalid with a subsequent history of deranged menstruation, miscarriages, premature deliveries, and bad recoveries. I often trace long years of perfectly preventable misery to the injudicious management of a bad getting up, so I consider defective involution to be most frequently caused by some form of post-partum uterine inflammation. The frequency of this, under a mild form, is admitted by many pathologists, and lately by Dr. Fordyce Barker in his work on Puerperal Fever. Still more recently Dr. Serdukoff has satisfied himself by clinical observation that involution is checked by metritis in proportion to its intensity. Sometimes it is endometritis, particularly when it has been necessary to peel away the placenta. In such a case an amount of laceration that would have soon healed up if the womb could have properly contracted may become a serious matter, if in an unhealthy woman the womb remain involuted. Most frequently, however, involution is checked by the bruising and laceration of the cervix uteri. This often repeated statement of Dr. H. Bennet's and of mine has been amply confirmed recently by the late Dr. Phillips, who, in recording his experience at Guy's Hospital, estimated the frequency of cervical laceration at 10 per cent. of ordinary labours, and as the rule in tedious labour; and Dr. Atthill, of Dublin, also admits that cervical laceration, as the result of labour, is frequently overlooked. No doubt most of these lacerations heal by first intention in healthy women, but when they are unhealthy or the rent extensive, as after the unskilful use of instruments, the sore festers and becomes a centre of congestion and inflammation, which arrest involution.

When these lesions are recognised and properly treated in the first months of puerperality, suspended involution is resumed, and the womb shrinks to its right size; not so when these lesions have been overlooked and allowed to proceed unchecked for a year or longer, for surgical treatment of the cervix will only be partially successful, and the body of the womb may remain too large. Indeed I sometimes infer the presence of defective involution from the fact of good surgical treatment having only been partially effectual, as in the following case:—

Mrs. C— is a well-proportioned woman of twenty-six, who had always enjoyed good health, notwithstanding tubercular family antecedents. She married at twenty-two, was delivered by the forceps eleven months afterwards, and made a good recovery. Thirteen months after the birth of the first child she was confined of a second, after two hours' labour. There were no marked pelvic symptoms while she kept her bed, but so soon as she began to try to get about she suffered much from bearing-down pains, back pain, vaginismus, mucopurulent discharges, nervousness, and general debility, which precluded nursing. This was found by a provincial practitioner to depend on inflammation and ulceration of the cervix and vagina, and he treated her very judiciously during seven months, and then I was consulted. I found

\* Todd's Cyclopædia, p. 702.

† Treatment of Puerperal Diseases at the Preston Retreat, Philadelphia, 1874.

the patient better in every way; the cervix was of the average size, and bore the impress of a recent application of potassa fusa cum calce. The body of the womb was slightly retroverted, and seemed about twice its right size to the finger in the vagina. The womb had an even outline, was painless to pressure, and a wax bougie easily entered the uterus to a depth of above four inches. In this case there was no record of red or brown vaginal discharges, nor of the acrid serous discharge of internal metritis; so I take it to be a case of defective involution caused by cervical inflammation, which confirmed it. I first depleted the womb by leaving in contact with the sore surface a dossil of cotton wool soaked in glycerine, and I afterwards well swabbed the cervix three times a week with tincture of iodine. Alum and zinc injections were prescribed; large doses of bromide of potassium were given at first, and then strychnine and iron. After six weeks of this treatment, the womb appeared healthy, the wax bougie measured three inches instead of four inches; strength had been gained, and four months after she left town I heard that she continued well.

When delivery is followed by a long-continued state of great debility, unattended by pelvic pain or by any characteristic vaginal discharge, a practitioner may well be excused for not having examined his patient, although the inability of explaining this chronic exhaustion by diarrhoea, or expectoration, or by profuse sweats, should lead him to suspect, that as this exhaustion originated in delivery, it might be kept up by something amiss in the womb. This long-continued exhaustion is sometimes caused by uncomplicated defective uterine involution, as in the following case.

Mrs. W— is a well-formed, healthy-looking lady, and is now twenty-six years of age. She had enjoyed good health, and married at twenty-three. She had a child nine months afterwards, then a severe attack of uterine inflammation, and before recovering from this, she became pregnant, about two months after delivery, for the second child was born eleven months after the first. She went on well and without a bad symptom till it was time to get up, and then she found she was too weak to stand, and during the following ten months her time was divided between bed and sofa. She was not hysterical in any sense of the word; she wished to be up and doing, but she could not walk or stand, and the debility persisted, although there was nothing tangibly wrong about her. She slept well, took a fair amount of food and wine, had judicious tonics, and did not lose flesh. She had not been able to nurse. I found a large flabby cervix, which admitted the first phalanx of the indicator; the body of the womb was regularly enlarged, painless to pressure, and moderately retroflexed. The wax bougie entered to the depth of over four inches. What I could see of the lining membrane of the cervix was very red. That was the only thing I found in addition to a very patulous os uteri, and defective involution. Possibly the entire lining membrane of the womb was as red as the part I could see, but I rather considered this to be a congestive state caused by defective involution than the *lag* end of endometritis, of which there had been no symptoms. Twenty months of incessant labour, either physiological or morbid, was too much for the womb in this case. Its tissues were paralysed, and the defectively involuted womb reacted unfavorably on the spinal

cord for about a year. In this case I freely used, twice a week, a strong solution of nitrate of silver inside and outside of the cervix, with the object of starting contraction by a local irritant. The patient was ordered alum and zinc injections, bromide of potassium at night, sulphate of quinine and extract of nux vomica in pills, and a stimulant embrocation to the abdomen. I followed this treatment for about a month without observing any amendment, till one day I noticed that the os uteri was very properly and firmly contracted. I suppose that this was an indication that the whole body of the womb was waking up to healthier action, for the patient began to mend from that time, and gradually recovered the power of walking. When she left town the cervix had its right consistency, the body of the womb was smaller, and the wax bougie measured about an inch less than it did three months before. Four months after she left town Dr. McClintock found the womb in a healthy condition.

In many of these long-standing cases of defective uterine involution the result is not so fortunate, for the womb never returns to its right size unless by the better management of uterine involution after another confinement.

From what precedes it appears that defective involution, to become apparent, requires to be associated with some other pathological condition; that by itself it is seldom a disease, but much more frequently the enlargement of the area in which a disease may originate, be it congestion, inflammation, ulceration, a polypoid or other growth. Moreover, defective involution not only magnifies the area of uterine disease—it makes it last longer and promotes relapses. The larger the womb, the greater its blood-supply, the more eccentric will be its blood-fluctuations, and the more difficult it will be to cure disease grafted on such a womb. Uterine involution being checked, there is a more or less extensive bag, with walls in a transitional state. The growth of the new muscular fibre may not proceed *pari passu* with the decay of the old; while the cervix has nearly recovered its right size and consistency, fatty degeneration may proceed too fast in the median region of the womb. This softness and pliability of the uterine walls clearly explain the frequent rise of post partum uterine flexions; whereas in the nulliparous womb the cavity is linear, the walls singularly firm and thick—it is extremely rare to find them softened,—so there is no pliability of walls to account for flexions of the virgin womb. Dr. G. Hewitt has lately stated that in young women of a delicate constitution there is not unfrequently a considerable softening of the virgin womb, the result of the general want of tone; but until a statement so contrary to my own experience is confirmed by other observers and by the teaching of the dead-house, I shall be disposed to fear that Dr. G. Hewitt's finger has been unconsciously biased by the desire to find so satisfactory an explanation of uterine malformations of the virgin womb.

**Diagnosis.**—I have already said that a soft flabby mass extending from the pubes to the umbilicus is a form of defective involution to be only observed in the earlier part of puerperality; that, generally speaking, after the third week the enlarged womb is to be felt well gathered up above the pubes. A vaginal examination gives the impression of the womb being larger than it ought to be, and its size may be more accurately esti-

mated by a rectal examination. A still more correct measurement may be taken by means of a wax bougie, for, as in a womb of the right size, it should be brought up at a depth of two inches and a half. If, after parturition, the bougie measures from three and a half to five inches, the excess of length must be attributed to an enlargement of the body of the womb, unless it can be explained by unnatural elongation of the cervix. From what I see and learn, I believe the uterine sound is often used to the detriment of the patient, and I will remind junior practitioners that during the two months of normal uterine involution, and for longer when it is defective, the walls of the womb are of a yellowish color, of a more fragile texture, and are therefore more liable to be perforated. A wax bougie No. 4 takes the measure well, and can do no harm.

I have something to add about the treatment of defective uterine involution, but I must reserve it for a concluding paper.

Seymour-street, Portman-square.

## THE CURE OF DIPHTHERIA.

By Dr. CESARE CIATTAGLIA, of Rome.

*Medical Notes, translated by*

J. P. STERLE, B.A., M.D. Edin.

I PROPOSE to publish some facts drawn from my experience in treating diphtheria; facts relating to the internal use, in large doses, of chlorate of potash, and to the local application of hydrate of chloral.

It is beside my purpose to dwell upon the genesis and nature of diphtheria, nor do I intend to explain the action of the two above-named drugs in that particular affection. I reserve myself for another paper on the nosogenic and therapeutic features of the whole subject.

The internal use of chlorate of potash in diphtheria is not new. Vogel recommended it so long ago as 1860, in half scruple or one-eighth of a scruple doses, dissolved in water, in the twenty-four hours, for children from one to five years of age.

The chloral, as far as I know, has not been prescribed before Ferrini, who, during last year's diphtheria epidemic in Tunis, observed its efficacy when smeared over the false membranes in a solution of from two to three grammes of the chloral hydrate to from fifteen to twenty grammes of glycerine.

From 1870 I had employed chlorate of potash combined with the local application of phenicated alcohol or of a weak solution of nitrate of silver, and I was generally satisfied with the success of such treatment. My friends and colleagues, Drs. Roseo, Grana, and De Rossi, confirmed the efficacy of the chlorate of potash, particularly in the diphtheria epidemic of 1872 in Carpineto Romano, Montellanico, and Anagni (province of Rome), when combined with the perchlorate of iron or the nitrate of silver applied locally. For these latter I have lately substituted hydrate of chloral, and it is the advantages it has yielded, and the desire to have these confirmed by other practitioners, that induce me to publish my experience.

The dose of hydrate is four grammes, dissolved in twenty grammes of glycerine, and applied with a camel's-hair brush, three or four times a day, to the false membranes. The chlorate of potash I have exhibited in doses of from ten to fifteen grammes a day dissolved in 140 of water, to children of from three to six years, and of thirty grammes to adults. With these medicines I have always combined a tonic and restorative diet.

One fact worthy the observation of practitioners is this: the moment the chloral and glycerine was applied the false membranes ceased to spread, while the characteristic fetor from the mouth entirely disappeared on the first or, at latest, the second day of application. I may add that the chloral, as dissolved in glycerine, besides remaining longer in contact with the diphtheritic surfaces, produces less of the burning sensation than when dissolved in water.

CASE 1.—A. N.—, a little girl aged seven, of delicate constitution, complained, on the 2nd February last, of slight sore-throat. On looking at the fauces I found two diphtheritic membranes on both tonsils of the size of two sixpenny pieces. There was no fever, no constitutional disturbance, not even engorgement of the cervical glands. I confined my prescriptions to simple gargles of phenicated water. Next day the membranes were more diffused, the fauces intensely red and swollen, and the engorgement of the glands increased. Temperature 39° C.; pulse 110; urine normal. I ordered at once fifteen grammes of the chlorate of potash, dissolved in 140 of water, to be given, one tablespoonful every two hours; and I smeared, thrice a day, the membranes with the chloral and glycerine. On February 4th the temperature was 40° C.; pulse 125. The membranes had ceased to spread. The urine presented traces of albumen. I continued the same treatment. In the afternoon I found the fever slightly abated; the fauces perceptibly less swollen and less red; the engorgement of the glands had also diminished, and the child was rather relieved. On the 5th, the fever had gone; the membranes had almost entirely disappeared from the affected surfaces. I reduced the exhibition of the solution of chlorate of potash to one tablespoonful every three hours, and the application of the chloral and glycerine to only twice a day. On the 6th, the improvement had continued. Engorgement of the glands scarcely visible, the urine normal, and the child more calm. On the 8th, the membrane on the right tonsil remained, but was less in extent. On the 10th the cure was complete. All next day I continued the chlorate of potash (one tablespoonful every four hours), and I ceased to apply the chloral and glycerine.

CASE 2.—On the afternoon of the 20th of March of this year I was called to Madame S. G., aged thirty, of a lymphatic temperament and sound constitution. By her account she had that day, while in her usual health, felt a burning, almost instantaneous, pain in the left side of the throat, for which she could give no reason. She tried to think nothing of it, till an aggravation of the symptoms, with the supervention of fever and rigors, made her send for me. When I saw her I found febrile heat, 39°, a guttural voice, engorgement of the tonsils and submaxillary glands, urine normal. The throat, on examination, showed a membrane on the left tonsil the size of a half-penny. I ordered twenty grammes of the chlorate

of potash in 140 of water (one tablespoonful every hour), and gargles of phenicated water. On the 21st March the fever had risen—the temperature was 40° C., the pulse 120; there was agitation and dyspnoea; the membrane had covered all the posterior surface of the mouth; the breath was foul; some points of the membrane had become gangrenous. I smeared the latter with the chloral (four grammes) and glycerine (twenty grammes), and repeated it thrice a day, with the regular solution of chlorate of potash, and also gargles of the same. On the 22nd the fever had rather subsided; the thermometer marked 38°; the pulse was 110°; the urine retained its normal character; the membranes presented no change; the feeling of oppression had diminished. With the treatment I combined a tonic and restorative diet. On the 23rd I found Madam S. quite apyretic; the membranes in the morning were still adherent, but in the afternoon they were almost completely detached; no fetid breath; the voice more clear; the general condition of the patient much improved. On the 24th there was nothing noteworthy, and I applied the chloral and glycerine only twice. On the 26th there was a very perceptible improvement, and on the 28th I suspended the application of the chloral, the fauces no longer presenting any trace of false membranes. I continued the chlorate of potash every three hours till, on the 30th, Madam S. was quite cured.

CASE 3.—On the 15th of April I was called to see a little girl of five years and feeble constitution. The evening before she had a fever attack, with slight frontal headache. When I saw her the fever was still present, but slight. On examining the throat I saw on the left tonsil a membrane about the size of a halfpenny. The engorgement of the glands was not very perceptible; the urine was normal. I prescribed regular treatment, and next day the membrane had shrunk by one half, and the engorgement was so reduced as not to be recognisable. The fever, however, was present. On the 18th the fever had quite gone, and by the 20th the little patient was quite well.

CASE 4.—On the Morning of the 17th of April I was called to Madame P. E., aged thirty, and of delicate frame. Since the 16th she had complained of difficulty in deglutition and profuse salivation. The fauces presented diphtheritic membranes on both tonsils; the engorgement of the submaxillary glands was remarkable. The temperature was 39.5°; the pulse was 120; the urine normal. I prescribed twenty grammes of chlorate of potash in 140 of water, one tablespoonful every two hours, and I smeared the membranes with chloral and glycerine three times a day. Shortly after this local application the pain in the throat diminished and deglutition became more easy. On the 18th there was a slight improvement; the fever almost as high as the day before; the urine still normal. I continued the same treatment. On the 19th the fever had gone; the patient felt somewhat better; the engorgement of the glands was perceptibly diminished; the diphtheritic exudation had in great part come away. On the 20th the patient said she had passed a slightly worse night, but I found no aggravation of the symptoms. On the 22nd the improvement was very marked. Treatment same as before. On the 23rd the fauces were almost free from false membrane. I continued the treatment up to the 26th, on which day the cure was complete.

CASE 5.—A. C., a girl eight years of age, of weak constitution, fell ill of diphtheria on the 1st of May. All the symptoms were grave. The false membrane covered all the left side of the fauces and the velum pendulum palati; perceptible engorgement of the submaxillary glands; dyspnoea; epistaxis and semi-sanguinolent flux from the nostrils of a most effusive fetor; breath very foul; pulse 125; temperature 40°; urine presented a marked amount of albumen. I immediately brought the patient under the chlorate of potash and smeared the diphtheritic surfaces with the chloral and glycerine. On the 2nd of May, no change but a slight decrease of fever. On the 4th a marked improvement: apyrexia, glands less swollen, respiration easier, epistaxis reduced to one attack, fetor quite gone. On the 5th membranes had in part come away, albumen in urine diminished; the little patient was much relieved. On the 8th the fauces were completely rid of the membranes; no trace of albumen in the urine; pulse, respiration, temperature normal; sometimes a little vomiting had occurred; there was aphonia, and I ordered Ruspi's syrup. On the 10th I left the patient quite well except the local weakness, which, however, I have since ascertained to have disappeared.

CASE 6.—On the 20th of April a boy of four and of strong constitution was attacked with diphtheria. On the left anterior pilaster of the velum pendulum palati I found a diphtheritic membrane of the size of two sixpenny pieces. Fever very mild, engorgement of glands scarcely perceptible, urine normal. The chlorate of potash and the chloral hydrate with glycerine were prescribed for five days, and at the end the cure was perfect.

CASE 7.—A case identical with the above was that of a girl six years of age, but of lymphatic temperament and weak constitution. I was called to see her on the 24th of April, when a slight fever had declared itself. She did not complain of pain or inconvenience of the throat; there was engorgement of the glands. On the left anterior pilaster of the velum pendulum palati, and extending over the velum itself, I found a diphtheritic membrane, the size of a half-penny. The urine was normal. I adopted the same treatment for this as for the other cases; and on the 25th found the febrile heat 39° C., the pulse 120, the engorgement of the glands beginning to appear, but the membrane shrinking. In the evening the improvement was general, the patient being relieved, and the deglutition—difficult in the morning—returned to the normal condition. On the 30th the little patient, who had been coming steadily round in the interval, was quite well.

CASE 8.—My distinguished friend, Dr. Alberto Rosa, invited me on the 10th of April to see one Cesare S., thirty years of age, and of good constitution, who, without apparent cause, had been attacked with diphtheria on the 31st of March. Dr. Rosa mentioned that on the first visit—on the 30th of March—there was slight fever and a marked redness of the fauces, accompanied by a scarcely perceptible engorgement of the glands, and by pain, with difficulty of deglutition. These symptoms betokened diphtheria, but for that evening Dr. Rosa confined himself to prescribing astringent gargles. Next morning diphtheria declared itself in a membrane covering the right tonsil to the size of a halfpenny, and in an aggravation of all the symptoms which accompany the

disease. The fever had risen to  $39^{\circ}$ , the glandular engorgement, particularly on the right side of the neck, being especially marked. He ordered sulphate of quinine internally and cauterised the membrane with nitrate of silver. A tonic and restorative diet made up the treatment for the day. By the eighth day the general condition was worse, and when I saw him the patient was reduced to a very low condition. The fever beat was  $40^{\circ}$  C.; the pulse 125. The throat revealed a membrane of the size of a penny piece, and extending up the posterior aspect of the velum pendulum palati; the glandular engorgement was marked; from the nares came an offensive flux; there was aphonia; and the albumen in the urine was moderate in quantity. I immediately prescribed the chlorate of potash, and the hydrate of chloral with glycerine. On the 11th of April the patient complained of nausea; then he had vomiting and twice fainted. I persevered with my prescriptions. On the 12th the improvement was very perceptible: the fever had declined, the throat was less painful, deglutition more easy. The membrane was still adherent, but had not extended. The urine contained less albumen. On the 14th the progress towards recovery was obvious: no trace of albumen in the urine; no shred of membrane visible. There was still, however, much prostration and anorexia, with restless nights and persistent insomnia. Dr. Rosa continued, for two days more, to prescribe the chlorate alone, with the tonic and restorative diet. Several days thereafter I found the patient quite well.

## ON TWO NEW FORMS OF TOURNIQUET.

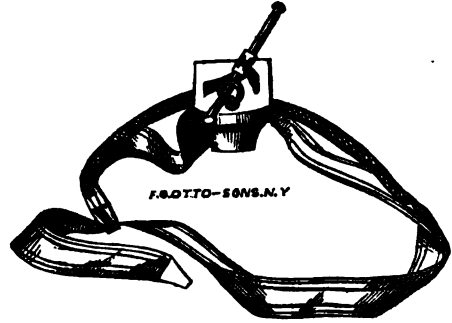
By JOHN M. HUNTER, M.D.,

Staff-Surgeon, R.N.

THE necessity of having some ready and very portable means of checking hæmorrhage arising from wounds has long engaged the attention of surgeons, especially those serving in the navy and army, and before going into action a number of simple field tourniquets are usually issued to some of the sailors and soldiers, with directions concerning the mode of their use. These tourniquets generally consist of a piece of webbing, a buckle, and a pad, and are buckled on as tightly as they can be pulled. When applied on the limbs of muscular men they are practically useless, and compress the artery slightly, or not at all. A more gradual and more powerful means of compression is required. The earliest kind of tourniquet was a band, and a stick for twisting it tight, called by sailors a "Spanish windlass," and, according to Ballingall, this form was first used by Morel at the siege of Besançon in 1674.

I have designed a modification of this ancient instrument, shown in the accompanying illustration, possessing, I think, all the qualities necessary for field use. It is very light, portable, and powerful. A piece of beech, or other hard wood, about  $2\frac{1}{2}$  inches long,  $1\frac{1}{2}$  inches broad, and from  $\frac{1}{2}$  to 1 inch thick, is shaped like the letter U at the top, which shape it preserves for  $\frac{1}{4}$  of an inch, when it is tapered down to form an oval concave pad  $1\frac{1}{2}$  by 1 inch. Through the top, and over the

centre of the pad, two narrow slots, or slits, half an inch broad, and half an inch apart, are cut sloping downwards and outwards, coming out where the pad begins to taper. To the underside of one of these slots, a piece of web about 4 inches long, carrying a buckle, is nailed by two copper tacks, and beneath the other a piece of web, about 18 inches long, is similarly nailed. A piece of French sennet, about 8 inches long, is passed through the two slots, and firmly sewn at the ends to the upper surface of each piece of web. A piece of iron wire 8 inches long, and gauge No. 9,



sliding loosely in a small tin tube, and having a drop of solder at each end to prevent its slipping through, is placed between the two slots, and the sennet is firmly sewn around the tube, which should have a projecting flange to prevent the sennet slipping off. A picture-frame ring is screwed into the upper part of the piece of wood at the rounded end, and a piece of chamols leather is fixed by shellac-cement to the face of the concave pad. The sennet being a little shorter than the web, from pad to sewing, takes the strain, and prevents the tacks from being pulled out when it is buckled around the limb. The iron rod is used as a lever to gradually twist round the sennet till a sufficient degree of compression has been reached, when it is fixed by sliding one end through the ring. The sennet is made by plaiting nine or eleven pieces of thickish soft twine into a common "flat plait," which should loosely fill the slots. As is usual, a piece of leather should be sewn under the buckle to prevent the skin being pinched. Should the person who applies the instrument be unacquainted with the position of the artery, it is of no consequence, for the closure of the vessels is effected by the general compression, as I have seen demonstrated in 1871 by Prof. Lister when performing his bloodless amputations. He used a Petit's tourniquet without any pad and placed the screw indifferently on any aspect of the limb. Professor Esmarch's elastic band still further exemplifies this.

This tourniquet, which I purpose calling the "torsion tourniquet," possesses certain peculiar advantages. The twisting is gradual and is borne by the sennet, which is capable of withstanding a torsion strain, which would break the web. The slots keep the power always over the centre of the pads, and prevents the sennet communicating the twist to the web, which lies perfectly flat on the limb. The rod sliding in the tube can be readily fixed at any half turn, however great the strain on the tube. The instrument can be easily and cheaply made by any carpenter and will stand any climate, whereas instruments depending for their

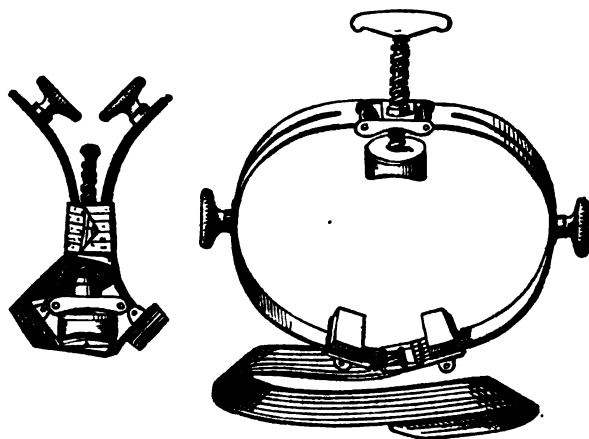
power on the elasticity of india-rubber are unreliable when exposed to the influences of climate or long keeping.

This and nearly all other tourniquets cause complete constriction of the limb, and, however useful as temporary measures, are exceedingly injurious when left on longer than two or three hours. They prevent the return of the venous blood and cause congestion, pain, and finally mortification. So serious have been the injuries produced through long-continued constriction of limbs by tourniquets, that some military surgeons have thought that more evil than good has resulted from their use. In the accounts of naval battles one often reads of the men unscrewing their tourniquets, and allowing themselves to bleed to death, rather than endure the pain of their wounds, the pain being caused, I believe, chiefly by the intense congestion produced by the constriction. After great land battles men are found who have had on tourniquets for twenty-four hours or longer, to the subsequent loss of limb or life.

Many attempts have been made, notably by the American army surgeons, to produce a tourniquet that would allow venous return—as do the aneurism tourniquets of Carte and Skey—and yet be portable. The two best forms I have hitherto seen are Messrs. Salt's dog-collar tourniquet, made of busk-steel, and Surgeon-Major Moffit's wing tourniquet. Messrs. Salt's from the thinness of the steel necessary for adjustment, assumes the elliptical form when the screw is tightened, and compresses the limb at the sides. Mr. Moffit's is very light and compact, but is liable to be canted over, and thus displaced, in spite of the large pad used, and at the same time only a small portion of the limb is unconstricted.

After making about sixteen different tourniquets, including some with the screw placed horizontally for greater snugness when on, and portable forms of Lister's tourniquet, I have produced the one shown in the accompanying illustration, which

ble to be carried in the pocket. The lower table of a Petit's tourniquet is removed, and an oval brass plate is substituted, carrying a thin wooden oval pad,  $1\frac{1}{2}$  in. by 1 in., made concave, as recommended by Lee, and covered with a layer of chamois leather. Hinged around each spill of the upper table is a curved steel arm,  $\frac{3}{4}$  in. in breadth, 1-16 in. thick, and  $4\frac{1}{2}$  in. long, with a curvature that causes it to measure  $8\frac{1}{2}$  in. from point to point. A slot a little over  $\frac{1}{4}$  in. in breadth is cut from the hinged part to within a quarter of an inch of the rounded end. Sliding beneath this is another steel arm of exactly the same dimensions, and curvative, but without a slot. One end has a slight shoulder, or turned-up part, to keep it in the same line as the first arm, and a screw with a milled head to fix it at any part of the slot in which the screw slides. At the other end of the arm is a hinged pad,  $1\frac{1}{2}$  in. by 1 in., having a slot through which to attach a small piece of web to one and a buckle to the other, and on its under surface a pad of vulcanised india-rubber,  $1\frac{1}{2}$  in. by  $\frac{3}{4}$  in., fixed on by copper wire. When packed for carrying, the set screws are run out as far as the stops at the top of each screw will allow, and the arms turned one into the other, as shown in the engraving. When required for use the arms are turned round, and fixed by the set screw at any position desired. By this means the difficulty of getting a tourniquet that can be made small enough for the arm or large enough for the thigh is overcome. The pad is then placed over the artery, and the instrument buckled tightly around the limb. A few turns of the large screw depress the pad on the artery, and slightly raise the rigid steel bands from the limb. Its appearance when in use is shown in the third engraving. The steel being blued, and the opposing surfaces of the bands being roughened with a draw-file, prevents slipping. The instrument when closed is  $4\frac{1}{2}$  in. in height and  $3\frac{1}{2}$  in. in extreme breadth, giving, when opened, a span of about 16 in., sufficient to free from constriction



possesses the necessary qualities of allowing the screw to make direct pressure on the artery, leaves the circumference of the limb free, excepting where the pad and point of counter-pressure touch it, thus allowing venous return, is free from danger of displacement when applied—for the pads of counter-pressure take a bearing on the limb, and keep the instrument in position,—has no loose pieces to be lost, and, finally, is sufficiently porta-

the whole of the arm, and seven-tenths of an average thigh at its upper part. The apparatus figured here was made by Messrs. Matthews, Carey-street, and has been found to answer exceedingly well. It is not expensive, and would be of great value in the hands of surgeons of the United Service when called upon to take off the temporary tourniquets in the numerous cases where time does not permit of immediate operation, and in cases of

accident in the country, where patients have to be sent several miles to hospital.

RESULTS OF  
THIRTY-FOUR CASES OF GASTROTOMY,  
PERFORMED WITH A VIEW OF EXTIRPATING TU-  
MOURS HAVING THEIR SEAT IN THE EPIPLOON,  
MESENTERIES, BROAD LIGAMENTS, PERI-  
TONEUM, SPLEEN, OR PELVIS.

By M. J. PEAN,

Surgeon to the St. Louis Hospital, Paris.

(From Notes translated by WILLIAM E. ROWLATT.)

THE following are the notes of all the operations of gastrotomy performed by M. Péan since the 20th February, 1868, to the 31st December, 1875, excepting those done with the object of removing tumours from the ovaries and the uterus. Some of them were performed owing to slight errors of diagnosis as to the seat of the tumour. Observation 35 is a case of complete extirpation of the spleen for a cyst which was developed upon that organ, and presents great interest owing to the rapid recovery of the patient, who is alive at the present moment, nine years after the operation, and the fact of this case being unique as far as we are aware.

**CASE 1.**—February 20th, 1868. Multilocular cyst of the broad ligament of the right side; general vascular adhesions; short pedicle. The surface of section of the pedicle cauterised; eight ligatures. Death from exhaustion.

**CASE 2.**—Multilocular cyst of broad ligament, resembling a fibro-cystic tumour of the uterus by the breadth of its pedicle; no adhesions. Removed in pieces, followed by cauterisation; several ligatures; tube left in the pelvis. Weight 18 kilogrammes. Death from pelvic peritonitis.

**CASE 3.**—November 5th, 1872. Abdominal tumour mistaken for an ovarian cyst. Punctured twice; exploratory incision followed by a flow of twenty litres of ascitic fluid. The bowels, with the epiploons and the peritoneum, were injected, and were bound together by firm adhesions. Recovery.

**CASE 4.**—June 19th, 1873. Areolar cyst of the broad ligament. Adhesions formed with mesentery, intestines, uterus, and abdominal walls; weight seventeen and a half kilogrammes; contained twenty litres of viscous liquid. Three different portions of the tumour which were excessively adherent were drawn together to form a pedicle, and were allowed to suppurate. Recovery.

**CASE 5.**—June 24th, 1873. Multiple cysts of the mesentery and great epiploon. Largest contained eighteen litres of blood-stained liquid; several were joined to the principal cyst by pedicles; general pelvic adhesions. Anterior surface adherent to great epiploon, which was partially separated from the cyst; the remainder was ligatured and excised; while the part which had been separated was replaced in abdomen; several ligatures. Recovery.

**CASE 6.**—August 19th, 1873. Unilocular cyst

of the left broad ligament; adhesions with uterus. Contained twenty-seven litres of serous liquid. Tube left. Treated by suppuration. Recovery.

**CASE 7.**—August 28th, 1873. Multilocular and areolar cyst of left broad ligament. Contained five to six litres of sero-purulent liquid. The areolar portion of the tumour presented an aspect of eucephaloid cancer. Adhesions with peritoneum, intestines, epiploon, and above by a strip with the inferior surface of the liver. Tumour extirpated by segments. Weight of whole mass, 1790 grammes. Death from peritonitis on seventh day.

**CASE 8.**—Sept. 25th, 1873. Multilocular cyst of right broad ligament; adhesions with uterus. Patient very weak; suffers from asthma. Weight of tumour, 2100 grammes; contained sixteen litres of liquid. Death from asthma on the fourth day.

**CASE 9.**—Oct. 16th, 1873. Multilocular cyst of left broad ligament; adhesions with epiploon, intestines, and uterus; latter organ greatly hypertrophied. No pedicle. Several ligatures. Suppuration. Weight 1275 grammes. Seventeen litres of liquid. Recovery.

**CASE 10.**—Dec. 11th, 1873. Areolar cyst of left ovary and broad ligament. Punctured once before operation; gave forty-eight litres. Uterus, greatly hypertrophied, was propelled through incision by tumour which occupied the whole pelvic cavity. The tumour was destroyed in two portions. The fundus of the uterus was amputated. Tube passed through vagina, passing out through the wound. Several hæmostatic plugs were left in the wound. Recovery.

**CASE 11.**—Jan. 6th, 1874. Fibro-cystic tumour occupying the pelvic cavity, and adherent to the mesentery. Contained several fragments of bone resembling the human skeleton; taken out in segments. Pedicle treated by suppuration. Recovery.

**CASE 12.**—Jan. 8th, 1874. Cyst of left broad ligament, adhering in front to abdominal wall, and behind to intestines; nine litres of liquid; pedicle ten centimetres in breadth. Left ovary was included in the wall of the tumour. Recovery.

**CASE 13.**—Jan. 15th, 1874. Cystic caucer of the pelvis. Twelve litres of purulent matter withdrawn. Numerous adhesions with intestines. Treated by suppuration. Death.

**CASE 14.**—Jan. 28th, 1874. Cancerous tumour of pelvis. Fifteen days before operation thirty litres of greenish gelatinous liquid withdrawn. Several cancerous tumours were found dispersed in the peritoneum. Wound closed. Death.

**CASE 15.**—Feb. 5th, 1874. Multilocular cyst of right broad ligament; areolar in its inferior portion; situated beneath liver and in epigastrium; vascular adhesions with mesentery and uterus. Eighteen litres of liquid. A portion of the tumour was formed into a pedicle, and drawn down to the inferior extremity of incision; remainder was tied with a portion of mesentery. Recovery.

**CASE 16.**—Feb. 26th, 1874. Cyst having adhesions with ovary and broad ligament and pubis. Sixteen litres of blood-stained liquid withdrawn by puncture. A large areolar portion of the tumour was adherent to the broad ligament by a large pedicle. This portion was suppurating. Adhesions with intestines; while trying to destroy these, a small opening was made into the intestine. Pedicle was ligatured. Death from peritonitis.



CASE 17.—March 24th, 1874. Cancer of the iliac fossa; adhesions with mesentery and peritoneum. Suppuration. Death.

CASE 18.—April 12th, 1874. Hæmatic cyst of the left broad ligament; no adhesions; traces of anterior peritonitis. Thirteen litres of greenish, serous liquid. A portion of the tumour was enucleated; the remainder was treated by suppuration. Recovery.

CASE 19.—May 10th, 1874. Unilocular cyst of left broad ligament; general adhesions with epiploon and bladder. After destroying the adhesions with the bladder, there was some difficulty met with in replacing this organ in the abdomen. The portion of the tumour adhering to the broad ligament was left. Seventeen litres of liquid withdrawn. Death from peritonitis.

CASE 20.—August 11th, 1874. Cyst developed in the right broad ligament, pushing a portion of the mesentery in front with the intestines dependent on it. Bladder pushed downwards by tumour. General adhesions. Five ligatures. Seventeen litres of liquid. Pedicle treated by suppuration. Recovery.

CASE 21.—August 18th, 1874. Multilocular and areolar cysts of left broad ligament; general adhesions with abdominal wall, epiploon, and intestines. One large sac was punctured, and gave twenty litres of purulent liquid. Six ligatures made in the peritoneum and mesentery. Enucleation was very difficult. Pedicle was very large. Treated by suppuration. Death from shock.

CASE 22.—Nov. 5th, 1874. Cyst of left broad ligament. No adhesions. Peritoneum was separated from the tumour, and the whole mass was taken away. A portion of peritoneum was drawn towards the wound. Ten litres of liquid. Recovery.

CASE 23.—Dec. 1st, 1874. Multilocular cyst of left broad ligament. Recent adhesions formed on its anterior surface; older ones behind with epiploon and intestines. There were also some adhesions with the uterus. Eighteen litres of liquid. Treated by suppuration. Death from cerebral symptoms on third day.

CASE 24.—Dec. 18th, 1874. Multilocular cyst of left broad ligament, containing nineteen litres of serous liquid. Treated by suppuration. Death from peritonitis.

CASE 25.—Jan. 28th, 1875. Cyst of the left broad ligament, containing a purulo-gelatinous liquid. The broad ligament was incised in order to attain the deep portion of the tumour, which was areolar in its structure. Treated by suppuration. Recovery.

CASE 26.—Feb. 2nd, 1875. Areolar cyst of left broad ligament; adhesions with mesentery, intestines, and uterus. Incision of broad ligament; enucleation. Treated by suppuration. Death on second day from peritonitis.

CASE 27.—April 20th, 1875. Cancerous tumour of mesentery and pelvis, resembling an areolar cyst. Death.

CASE 28.—May 4th, 1875. Cyst of the right broad ligament; no adhesions; small pedicle. Treated by suppuration. An abscess opened into bladder. Recovery.

CASE 29.—Sept. 14th, 1875. Multilocular cyst of right broad ligament, containing nineteen litres of serous liquid; adhesions with abdominal wall and epiploon. Treated by suppuration. Recovery.

CASE 30.—Sept. 28th, 1875. Cyst of left broad ligament, containing twelve litres of purulent liquid; adhesions with uterus. Five ligatures. Recovery.

CASE 31.—October 25th, 1875. Areolar cyst of left broad ligament and mesentery; intestines were pushed forwards. Enucleation was extremely difficult; portion of peritoneum was drawn forward and applied to the wound. No pus. Drainage tube passed through vagina. Death from acute peritonitis.

CASE 32.—November 11th, 1875. Cystic cancer of the pelvis, situated behind the uterus. Death.

CASE 33.—December 14th, 1875. Cystic cancer of left iliac fossa. Adhesions with ovary, uterus, and bladder. Death.

CASE 34 (splenotomy).—September 6th, 1867. Cystic tumour of the spleen, which was greatly hypertrophied. Surface of tumour was very vascular. Several portions of the spleen were ligatured and taken away with portions of the tumour; remainder taken away with pedicle, and surface of section cauterised with hot iron. Peritoneum was washed; weight 1140 grammes. Five litres of liquid charged with leucocytes and cholesterine. Recovery.

## ON GELSEMINUM SEMPERVIRENS.

By SYDNEY RINGER, M.D.,

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and

WM. MURRELL, L.R.C.P., M.R.C.S.,

Demonstrator of Physiology at University College.

(Continued from August No., p. 357.)

### ACTION ON THE PUPILS.

STRANGE to say, the internal administration of gelseminum produces an effect opposite to that occasioned by its local application to the eye itself. When given by the mouth in doses sufficient to produce symptoms, the drug, in every instance but one, caused contraction of the pupil. Indeed, in the case in which the drug produced weakness of the legs with a strong double internal squint, the pupils were contracted to a pin's point. In the exceptional patient just referred to, on whom we made two observations, though on each occasion we produced great giddiness, haziness, susceptibility to light, and diplopia, the pupils did not contract, but manifested a very unsteady condition, varying greatly in size in rapid alternation without any apparent cause. In another patient, the pupils were strongly contracted when exposed to light, but they dilated freely in a darkened room; and when they recontracted on exposure to light they seemed in an unstable condition, oscillating a good deal. The contraction of the pupil does not cease on the disappearance of diplopia or dimness; indeed, when the dimness has passed away, the contraction of the pupil may increase.

In the cases of accidental poisoning it is recorded that during complete general paralysis the pupils are widely dilated, and therefore it might be inferred that the condition of the pupil depends on

the dose—a moderate dose contracting, a very large one dilating, the pupils. This explanation is possibly in part true; but the dilatation might be due likewise to the asphyxia induced by large doses. Thus Dr. O. Berger finds, and our observations confirm his statements, that dilatation of the pupils in poisoned animals occurs only when asphyxia from paralysis of respiration has set in, and that artificial respiration at once causes the pupils to contract.

On the other hand, the topical application to the eye dilates the pupil. We employed, in the first instance, a tincture (1 in 10) and the American liquid extract. These preparations dilate the pupil slightly, but they excite great irritation and smarting. We then employed the alkaloid prepared by Mr. Gerrard—one grain in twenty minims of water, a solution which causes scarcely any smarting. Mr. T. Fox and Mr. Sydney Pearce have made for us nineteen observations. A few drops of the solution were put into one eye, and in each case this trial pupil became widely dilated, the dilatation usually beginning in about thirty minutes. Not only does the pupil dilate, but the muscle of accommodation becomes paralysed and the sight affected. In twenty-four hours vision again becomes nearly natural, but the pupil remains dilated much longer—sometimes, indeed, for a week, or even a fortnight.

The fact that the internal administration contracts the pupil led us to examine carefully whether the local application to the eye causes any primary contraction; and in three instances we thought we detected very slight contraction, lasting only a few minutes.

The local application also dilates the pupil of rabbits and cats. The pupil of a cat being extremely sensitive, we thought that if the local application did cause primary contraction, we should detect it best in this animal. In the five observations we made the pupil in each instance became decidedly contracted before dilating. In one instance the contraction began in two minutes, in another it was delayed fifteen minutes; the average time being ten minutes. Its average duration was twenty-four minutes, and it was followed by wide dilatation.

It occurred to us that possibly the contraction might be due simply to irritation. We therefore made five test observations on two cats on different days, using respectively a solution of alum (one in twenty), of common salt (one in twenty), of quinine (one in thirty), of strychnia (one in 120), and of dilute acetic acid, with an equal quantity of water. We applied these solutions freely to one eye, causing quite as much smarting as follows the application of gelseminum, and then watched the effects carefully. We could detect no contraction except with the quinine experiment, in which case we thought that, five minutes after the application, it had produced slight contraction of the pupil, but on re-examination a few minutes later this had disappeared.

We have said that the local application dilates the pupils, but we must add that in rabbits absorption sometimes takes place so readily, and these animals are so easily affected by the poison, that they became asphyxiated, and die before the pupil has time to dilate. The contracted pupils due to the internal administration of the drug, and the dilated pupils due to its local application, are both associated with dimness of sight.

We have seen that the internal administration of gelseminum contracts the pupil in man and the lower animals, and that dilatation occurs only on the supervention of asphyxia, which at once disappears on the employment of artificial respiration; showing that this dilatation is due to the asphyxia and not to the drug. It occurred to us that the internal administration would probably dilate the pupil, but that a dose adequate to produce this effect so quickly would paralyse the respiratory centre and that the animal would die asphyxiated before the drug had time to dilate the pupils. To ascertain the validity of our conjecture, we made a rabbit insensible with seven grains of chloral, then inserted a cannula into its trachea, and injected into the subcutaneous tissue of the axilla thirty drops of the liquid extract, and at once commenced artificial respiration, to prevent the advent of any asphyxia. In seventeen minutes we thought the pupils were a little contracted; in twenty-six minutes well-marked signs of paralysis set in, shown at first by a difficulty in keeping up the head; in half an hour the animal could not raise its head off the table, whilst it still retained considerable power over its trunk and extremities. At this point the eyes became prominent and the pupils began to dilate, and in thirty-four minutes the animal tumbled over on its side, and then we noticed that the pupils were decidedly larger and the eyes more prominent; but as at the expiration of an hour the pupil had not become widely dilated, we repeated the thirty minims of liquid extract, injecting it in two places into the subcutaneous tissue. Paralysis rapidly increased till it was complete in the anterior part of the body, though still the rabbit had considerable power over its hind legs; but at last these also became almost completely paralysed, and the animal lay on its side in a helpless state. As the paralysis advanced the pupil dilated somewhat, till at last it became above double its original size, though it never reached the degree of dilatation observable in man and cats after the local application of the alkaloid. We noticed that the animal retained the power of closing its eyes quickly and strongly, even after almost complete general paralysis, whence we conclude that the seventh or some of its branches is one of the last nerves to undergo paralysis. While performing this experiment we noticed that the anterior part of the body was first and most severely paralysed, for after the anterior limbs were almost helpless the animal retained a good deal of power over the posterior extremities, which likewise at last became helpless.

On another occasion we repeated this experiment, and continued artificial respiration for two hours and ten minutes. During this time we injected under the skin a drachm of the liquid extract three times, completely paralysing the rabbit. At first the pupils became slightly contracted, but under the full effect of the drug they were slightly dilated. This experiment shows clearly that the internal administration of a large dose will dilate the pupil, though not considerably.

We have seen that gelseminum internally administered at first contracts and then somewhat dilates the pupils, and that it dilates them when locally applied. How does it produce these effects? Through the third nerve or through its influence on the sympathetic? We are unable to answer these questions, and we shall rather indicate the difficulties to be contended with than hope to explain them.

Assuming that gelseminum first stimulates and then paralyzes the third, it would seem that its action can thus be readily explained; but a little consideration will show that this view is inadequate. Thus we find that the internal administration contracts the pupil—due, we assume, to stimulation of the third nerve; but this contraction persists even when the muscular branches of the third are paralyzed. It may be said that to paralyze the branch of the third supplying the iris a larger dose is required than is needed to paralyze the branches supplying the recti and other muscles, and hence whilst these muscles are paralyzed the pupil continues contracted. But this supposition is inadequate to explain why the topical application should widely dilate the pupil without paralyzing the muscles. We are forced to accept the feasible assumption that, topically applied, gelseminum has a stronger affinity for the termination of the branches of the third supplying the iris than for the branches distributed to the orbital muscles.

(To be continued.)

#### ON THE USE OF THE HYPOPHOSPHITES OF LIME AND SODA IN PHTHISIS.

By M. CHARTERIS, M.D.,

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Glasgow Royal Infirmary.

(Concluded from August No., p. 365.)

REFERRING more especially to hospital cases, I find that since the month of May last thirty cases of phthisis have been admitted into my wards. Excluding five cases at present under treatment, and referring simply to the thirty cases in which definite results have been obtained, it has been noted that thirteen left the hospital improved, twelve not improved, and five died.

The following cases may be given as briefly illustrating what is meant by the terms used.

T. T—, aged thirty-seven, a brush-maker, was admitted on May 13th, 1875. He complained principally of a dry, hacking cough, which was pretty constant. This had lasted for a month, appearing after convalescence from typhus fever. The sputum was small in quantity, brought up with difficulty, and consisted of thin mucus, and three days before admission he had coughed up a small quantity of blood. He was subject to heavy night-sweats, had a bad appetite, and was much emaciated. Temperature 100°. On examining the chest, a slightly flattened condition of the left side was observed; indistinct mucous crepitation over left apex, where there was also slight dulness. The patient took three grains of hypophosphite of lime thrice daily. During the next four days there was not much change, but on the sixth day the sweating had entirely disappeared, and ceased permanently from this date. The cough and weakness, however, still continued, and it was found that in this and other cases the ipecacuanha wine spray promoted expectoration and relieved the cough. Improvement continued steadily and

gradually, the appetite increased, and the general condition may be best described as "bright and cheery."

After six weeks' residence in the hospital he was sent to the convalescent home. At the end of August he was seen following the occupation of a musician on board a Clyde steamer, and although much exposed, he did not seem to have fallen off in any way, stating "that he never felt better in his life."

M. C—, aged eighteen, a mill girl, was admitted on June 17th, 1875. She was a very strumous subject, and had caries of the metatarsal bones of the left foot, and a scrofulous swelling of the neck. The patient had always been delicate, and the family history was not good. Latterly her cough had greatly increased. She was much emaciated, and subject to nightly perspirations. Distinct evidence of phthisis was found at both apices, back and front. The sputum was profuse, frothy, and muco-purulent. She was ordered three grains of the hypophosphite of lime thrice daily, and by the 24th the sweating had gone, and she looked more hopeful and in better spirits. The temperature since her admission had averaged 100·2° in the evening.

This somewhat improved condition was not permanent, for on July 4th she suddenly became sick, and vomited. Diarrhoea set in, the sweating returned, and the temperature ran up to 102·4°. The dose of the hypophosphite was increased, but no improvement was manifested, and on July 8th she was permitted to go home at the urgent request of her friends.

This may be considered a somewhat typical and common instance of a phthisical patient dismissed "Not improved." It was generally found in these cases that, although the sweating was always stopped by the hypophosphite, the general health did not improve, neither did the chest symptoms, and it was deemed advisable to permit the patient to leave.

The following case was treated from first to last by the hypophosphites:—

E. W—, aged twenty-eight, was admitted Nov. 10th, 1875, suffering from cough, pain in left side, loss of appetite, and general weakness. Patient states that she enjoyed good health till five months ago, when her present illness began with slight hæmoptysis. The cough set in immediately afterwards, accompanied by an expectoration of a frothy and slightly black character. On examining the chest there was distinct flattening of the infraclavicular regions of both sides. On the left side there was dulness on percussion, with all the other evidences of a large cavity. Small crepitations were also heard all over the chest on both sides. The temperature was 100° in the morning, and 100·5° in the evening.

Some improvement was manifested from the 14th till the 27th of November, as the temperature ranged from 98° in the morning to 99° in the evening. The night-sweats also ceased.

From Dec. 1st till the day of her death on Feb. 29th the temperature steadily rose, and latterly ranged from 100·5° in the morning to 102° in the evening. The night-sweats also returned, and the hypophosphites in no way checked them. The physical signs also indicated rapid disorganisation of the right lung.

*Autopsy.*—Body much emaciated; slight oedema of feet. On opening the thorax, the right lung

was bound to the wall of the chest both anteriorly and posteriorly by recent adhesions. On cutting into the lung itself, it appeared riddled with small abscesses, with two large cavities in the upper lobe; weight 33 oz. Over the lower lobe of the left lung there was a cicatrix about three inches in length, and, on cutting into the lung at this part, a large cavity was seen filled with pus, as well as several cavities at other parts; weight 22 oz. The liver was fatty, and weighed 45 oz. Spleen and kidneys normal.

These cases are faithful examples of the use of the hypophosphites in phthisis, either in the form of lime or soda. That the medicine is not inert its power of checking night-sweats evidences, and also its influence in giving tone to the system, if by this is meant increase of appetite and general cheerfulness. Without expressing a definite view on the subject, I have been somewhat forced to the conclusion that if the hypophosphites did no good, they certainly did harm, and in some measure hastened a final issue by increased fever, as indicated by a higher temperature. While acknowledging the benefit derived from their use, as testified to by patients themselves and by competent witnesses, I am of opinion that they should by no means be used indiscriminately, and that when given their effect should be carefully watched by daily thermometric observation.

In further alluding to the difference of temperature in the sides affected in phthisis, the following results have been noted:—In one extreme case, following an attack of pleurisy of the left lung, and where the right was unaffected, the average increase of the evening temperature for a month was  $96^{\circ}$ , or very nearly a degree. In another, where the right lung appeared alone affected at the apex, the result of ten observations showed a difference of  $38^{\circ}$  in the morning and  $40^{\circ}$  in the evening. In another case, at present in the hospital, and where there are absolutely no other physical signs of phthisis except weakness and emaciation, the following facts have been recorded as the result of temperatures taken morning and evening, and extending over a period of ten days:—Evening: left side, average  $101.86^{\circ}$ ; right side,  $101.56^{\circ}$ . Morning: left side,  $100.38^{\circ}$ ; right side,  $99.96^{\circ}$ . Health certainly gives no variation like this, and no other disease simulates phthisis so much as enteric fever. A case of enteric fever was admitted into my wards on the same day as the one last mentioned, and the temperature was taken carefully on both sides, with the result of finding no appreciable difference, the average being on both sides  $99.4^{\circ}$  in the morning and  $101.2^{\circ}$  in the evening, and, as convalescence was reached,  $98.2^{\circ}$  in the morning and  $99.6^{\circ}$  in the evening.

Byltswood-square, Glasgow.

## CEREBRAL HÆMORRHAGE; APHASIA.

By JAMES WILSON, M.D.,

Physician to the Worcester General Infirmary.

GEORGE F—, aged seventy, was admitted into the infirmary under my care on April 28th, at 9 P.M., having been brought in from the streets in

a fit. On admission he was pale and insensible, but could be roused to a certain point on speaking loudly to him. There was slight paralysis of the right upper extremity, aphasia, and convulsive twitchings of the arms; no facial paralysis. Breathing natural; pulse 72, indicative of renal disease. Upon drawing off his water this was found albuminous and of low specific gravity. Ordered a purgative and sinapism to loins.

April 29th.—Bowels moved freely during the night, and has passed water under him; is very drowsy this morning, and mutters to himself; lying on his back, mouth open; face slightly flushed; angle of mouth natural on both sides, no facial paralysis; slight ptosis of right eyelid, no squint; contraction of both pupils. Upon speaking loudly, answers questions after some moments, but incoherently; protrudes and withdraws tongue naturally. Respiration normal; pulse 60; skin cool; temperature same on both sides of the body. Heart-sounds normal. The power of grasping with the right hand is but slightly impaired when compared with the left, and there is no paralysis of lower extremity; no diminution of sensibility; can swallow easily.—8.30 P.M.: Face flushed; labored breathing. Pulse very weak, barely 60; temperature  $102.2^{\circ}$ . Ordered two teaspoonfuls of brandy, and repeated every hour, pulse being watched.—11.30 P.M.: Pulse fuller, but not quickened, 60. Brandy increased to a tablespoonful every hour.

30th.—10 A.M.: Pulse very irregular, from 60 to 70; temperature  $100.5^{\circ}$ ; breathes easier; has passed water twice into the chamber when given him. Urine clear, sp. gr. 1019, slightly albuminous. To continue brandy in half-ounce doses every two hours; beef-tea and milk *ad lib.*—11 P.M.: Pulse 80, easily compressed; temperature  $102.6^{\circ}$ ; skin hot; face flushed; slight difficulty in swallowing; picking action with right hand; has passed a large quantity of water during the day. Brandy reduced to a tablespoonful every four hours.

May 1st.—Pulse 62, small, still very irregular; temperature  $101.6^{\circ}$ . Got out of bed during the night; head thrown back; muscles of back of neck tense; mouth open; tongue thick, red, and dry on the dorsum; swallows better; pupils small and equal; mutters almost incessantly to himself, and lies on back; convulsive twitchings of both hands, and inclined to pick at bedclothes; slight cough; still answers as before when roused; passes water, when the chamber is given him, naturally; bowels confined; urine no longer albuminous, sp. gr. 1010. Brandy every two instead of four hours; beef-tea and milk *ad lib.*—10 P.M.: Pulse risen to 72; temperature  $102^{\circ}$ .

2nd.—Less retraction of head; still muttering, and yawns frequently; pupils contracted. Pulse 70; temperature  $100.5^{\circ}$ . Tongue dry and cracked; convulsive twitching and picking action less. Brandy, &c. &c., as before.

3rd.—Some improvement. Tries to get out of bed when about to micturate. Less aphasia; no paralysis; slight jerking of muscles of right arm. Pulse 70-75; temperature  $100^{\circ}$ . Ordered a stimulant mixture.

4th.—Great improvement. Less muttering. Jerking of muscles of right arm nearly gone. Answers distinctly to questions, and does not relapse for some time. Tongue moist; pulse 80, irregular; temperature  $100^{\circ}$ . Brandy as before.

Takes plenty of beef-tea, milk, &c. Bowels to be acted upon by two drops of croton oil.

5th and 6th.—No change in symptoms, except general improvement. Bowels have been well opened.

7th.—Not so well this morning. Slight facial paralysis left side, and convulsive twitching of both arms. Muttering almost incessantly. Breathing deep and labored. Pulse 78; temperature 100°. Takes all his nourishment. No difficulty in swallowing.

9th.—Again improved. Facial paralysis gone; no twitching of arms. More rational. Tongue brown, and inclined to dryness; breath very offensive. Bowels to be opened by calomel. Brandy and stimulant mixture as before.

12th.—Condition much about the same. Takes all his nourishment, but sinking slowly. Pulse 68. Breathes easier. Temperature 98°. Carbonate of ammonia added to the mixture. Brandy, &c., as before.

16th.—Return of convulsive twitching in arms and facial muscles of left side. Upon being roused, complains of pains in both arms. Lividity of cheeks, and tremulation of mouth. Pulse 54, very weak. Respiration labored.

17th.—Convulsive movement of arms and face gone. Otherwise the same.

18th.—Died at 4.30 P.M., from asthenia.

*Post-mortem examination.*—The calvaria being removed, the membranes were found slightly congested, and a little lymph situated over the anterior third of the left cerebral hemisphere. On making a section of the brain in the usual manner, the brain-substance was found to be perfectly healthy as far as the level of the corpus callosum, and both lateral ventricles contained a little more than the normal amount of fluid, but not sufficient to cause pressure. Examination of the remaining part of the left anterior cerebral lobe showed that the central portion of it was broken down, and occupied by a large clot which had extended backwards into the substance of the corpus striatum and optic thalamus. The clot was about the size of a small orange, and had partly undergone absorption at the edge; central portion consisting of dark coagulated blood. The brain-substance around the clot was in a softened condition. The right side and cerebellum were quite healthy. Heart healthy, no hypertrophy, rather under natural size. Kidneys each three and a half ounces; capsules adherent; numerous large cysts existed in the cortical portion, which was in a granular condition.

*Remarks.*—This extraordinary case (for I cannot find a parallel to it on record), considered in its two leading points—(1) the degree of paralysis &c. in comparison with the extent of lesion of the motor tract of one half of the brain; (2) the length of time the man lived with such a lesion—appears to me to be worthy of publication. Firstly, that the functions of the left corpus striatum could be compromised to such an extent, as might reasonably be inferred they would be from the amount of destruction to that centre, and yet the external symptoms be so slight, is of itself strange; but when conjoined with a similar affection of those appertaining to the left thalamus opticus, the case appears truly remarkable, and would seem to me to create a diversion from the rule that though paralysis is not in ratio to the amount of lesion, yet to have such injury to two

motor ganglia and no marked paralysis is certainly an exception, and by no means the rule. Secondly, the length of time the man lived is also strange, twenty days elapsing from the date of hæmorrhage to the day of his death. Looking at the case now, I have no doubt that the stimulation was good and probably prolonged his life, for there was decided improvement in his general condition after it; and it must be remarked that the pulse was not quickened, its volume only increased, nor did repeated stimulation sensibly decrease it. One very important point, however, seems to be gained from this case, and which strengthens Dr. Brown-Séquard's theory of the dissemination and not localisation of cells, and that aphasia does not necessarily have its seat in the third frontal convolution of the left side or the insula &c., for this part of the brain-substance must have suffered seriously in its cell functions, and yet aphasia was not a marked symptom.

Worcester.

## CLINICAL COMMENTS

ON A

### CASE OF ACUTE GENERAL LICHEN PLANUS, SIMULATING PAPULAR SYPHILITIC RASH, IN A BABE.

By TILBURY FOX, M.D. Lond., F.R.C.P.,

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I INVITE attention to a very interesting case of lichen planus, the eruption of which may readily be mistaken for a syphilitic rash. We have seen a good many instances of lichen planus together amongst the out-patients of University College Hospital during the last year, but none have exceeded in interest, from a diagnostic point of view, the case upon which the subjoined remarks are based. The following is its history:—

Kate F—, aged nine months, was brought to me at University College Hospital, on July 1st, 1873, with “a rash which had come out all over her.” The mother was fairly healthy, but there was a suspicious history about her of syphilitic infection. She has lost her hair, her throat has been sore at times, though not in any marked degree. She suffers from “chronic rheumatism” about the hips and head, and she has had five miscarriages. The child in question was born at the full time, and is declared to have been quite healthy until it was six months old, and then she was vaccinated. The operation did not succeed, but three or four days afterwards the mother noticed some pimples on the left hand. They “looked like bites,” she says, and just like the “point appears when vaccination is taking.” A fortnight afterwards other spots appeared about the buttocks and ankles, and by degrees all over the arms. The body was next attacked by a “thick, fine rash.” The eruption itched a great deal, and worried the child considerably. The mother states “that at first the spots were quite separate the one from the other, of a very bright-red color, very pointed [she means raised], whilst they quickly began to flatten,

and, as they became flattened, the skin of the point seemed to die off." At the same time "they became shiny-looking," and assumed "a purplish tint." After a while the spots began to arrange themselves in clusters about the ankles, the buttocks, and the arms. The disease, the mother adds, "has been just that rash the whole time." Such is the mother's description. It shows that the eruption is, and always has been, a papular one, patches being formed by the crowding together of papules.

**Present state.**—The child looks quite healthy. She is well nourished, has not lost flesh, and exhibits no sign of cachexia of any kind. On the face, over both cheeks, are twenty or thirty scattered, distinct, reddish-brown firm-feeling papules, the size of large pins' heads. At the back of the neck, and about the forehead and the temples and across the nose, there is a small palish-red papular rash, uniformly scattered over the surface in these situations. The papules are slightly raised, and of the size of pins' points or rather larger. Over the arms, the legs, and the buttocks the rash is not unlike a papular syphilide, consisting of large, reddish-brown, firm papules, most of them discrete, but many aggregated together. Over the back and the abdomen the rash is "much finer," and made up of smaller, flatter, and paler papules, as thickly set together as though each follicle were attacked.

All the papules, whether large or small, were at first bright-red, but have faded after a while in color, and have become flattened at their apices and "shiny-looking." The papules have this additional feature in common, that they flatten at their apices, are more or less angular at base, and exhibit in their centres a minute puncture, indicative of the opening of the hair-follicles, which are the anatomical seat of the papules; whilst, viewed by a side-glance, the papules exhibit a glistening appearance, and this gives a shining look to the skin as a whole, where the papules are thickly crowded together *en masse*.

**Remarks.**—The disease looked like syphilis, and the idea of its syphilitic nature was countenanced by the fact of the mother being syphilized; but then there was an entire absence of any sign of cachexia or other concomitant signs of syphilis in the child. Supposing the rash to be syphilitic it was so plentiful that the child could not but be considered as very syphilitic, and yet it was certainly the reverse of syphilitic, judging from its general state and special local phenomena. The rash was definite and uniform in character, not multiform, as in syphilis. It was papular throughout its course, and the papules were characteristic of lichen planus; they were dull red in color, angular at base, flat and shining at their apices, each with a central puncture, and patches were formed by the crowding together of the papules.

It is rare to see the disease in so young a child, and it is an important matter to recognise the disease, lest an anti-syphilitic treatment be adopted in such a case.

The disease begins as a vaso-motor disturbance of the deep part of the hair-follicles, which is followed by hyperplasia of the cell-elements of the root-sheath. It indicates defective nutrition from defective nerve-power, and the treatment consists in free inunction of oil, to diminish the hyperæmia and soothe the skin, and internal tonics, especially

good food and iron, with diuretics should the skin be very hyperæmic over a large extent of surface.

The disease in this case was diagnosed as papular eczema by a foreign medical man of some distinction, who was present when the child came to me. Herein is another instance of what I have repeatedly said in print, that under the term eczema the most diverse things are classed. An American physician who was present when the child was under examination on one occasion, and whose opinion is entitled to considerable respect, informed me that the case would have been regarded as syphilitic at Vienna. I have given my reasons why it is not syphilitic, and pointed out how it exactly corresponds to the description in all particulars of lichen planus; and if my informant be right, the dermatologists of Vienna have yet to learn what lichen planus, especially in a child, is. As showing that Hebra and others have yet to recognise English forms of skin disease, I may mention further that this same gentleman saw several cases of *contagious impetigo* which happened to present themselves amongst my out-patients at University College Hospital, and having satisfied himself of its distinct and peculiar features as a separate disease, and by inoculation of himself, he informed me that the disease which I showed him was not that which Hebra and others at Vienna recognised as *impetigo contagiosa*, but that these gentlemen seem to regard severe impetigo of the face as my impetigo *contagiosa*; but I have in the clearest manner pointed out that the disease consists essentially of distinct isolated vesico-pustules, and not patches. I again urge the necessity of remembering that diseases vary in aspect in different countries, and that the German text-book cannot be taken as an exact guide to English skin diseases, nor will an English text-book afford true descriptions of typical instances of disease as seen abroad.

The child rapidly recovered under the influence of steel wine and the free use of linimentum aque calcis externally.

## A SUCCESSFUL CASE OF OVARIOTOMY.

*Reported by*

THEODORE MORGAN, M.B.,

Assistant Colonial Surgeon in Charge of the Civil Hospital,  
Point de Galle, Ceylon.

HINGOHAMY, a spare Sinhalese woman, aged forty years, was admitted into the hospital at this station on the 25th of February, 1876, with the following history:—She is the mother of three children; the last one being fourteen years old. About ten months after the birth of this child, she perceived the first indication of a distension in the left side of her abdomen. The tumour subsequently increased in size, till it occupied the right side and reached two inches above the umbilicus. During this time the patient never suffered from any irregularity of her menstruation.

February 28th having been fixed for the operation, the walls and ceiling of the operating and patient's rooms were splashed with a solution of carbolic acid, and ventilated by means of revolving

fans, treated in the same way. Dr. Anthonisz, with the aid of Dr. Maxham, staff-surgeon, having seen that the patient was well under chloroform, exposed the tumour by an incision three inches long on the linea alba, tapped the contents, and, as the sac was being emptied, drew it out gradually, exposing the pedicle and inadvertently causing a knuckle of the intestine to protrude. Some clean lint and a towel were immediately thrown over it, and the windows closed, to protect it from any change in the temperature. The bowel was next carefully replaced, and a double hemp ligature was passed through the pedicle, which was secured in two halves, and a second ligature put round it, and the growth was detached from its pedicle and removed. It was free from adhesions to the neighboring structures, though, from the shortness of the pedicle, a portion of the left Fallopian tube was unavoidably removed. A vertical incision was next made on the left side, half an inch long, on the margin of Poupart's ligament, through the abdominal wall. The pedicle being returned into the abdomen, one end of the ligature was drawn through this opening so as to make the divided surface of the pedicle rest on the edges of the wound, and secured externally. The lips of the median wound were next brought together by the aid of three long needles, and the other end of the ligature secured outside this opening. Layers of lint soaked in a solution of carbolic acid, and a broad bandage round the abdomen, completed the dressing.

The patient, still under chloroform, was removed into another room, the door of which was provided with a curtain, which had been exposed to the action of carbolic acid. On recovering consciousness she was desired to preserve a semi-recumbent position and to keep quiet. Ordered two grains of opium every three hours. She slept well, and next morning (February 29th) her temperature was  $102^{\circ}$  and pulse 112. She had passed no urine, and was relieved by a catheter. The inguinal dressing was saturated with discharge. Opium continued every fourth hour; arrowroot and milk diet. On the 1st March the temperature and diet were the same as on the previous day, and the dressings were renewed. The opium was reduced to one grain. Next day (March 2nd) the temperature was  $102^{\circ}$  and pulse 100. Urine had to be drawn off on this as well as on the preceding day. On the 4th there was no fever; the bowels were relieved by enema on the 5th, and the opium was then discontinued. On the 8th the needles were withdrawn, as the wound had healed, excepting a little spot round the ligature. On the 20th the end of the ligature in the median incision came away, and was followed on the 27th by the detachment of the other end in the groin. The case progressed without an untoward symptom, and was discharged from hospital on the 16th April, forty-nine days after the operation.

In concluding the report of this interesting case, attention may briefly be drawn—first, to the "antiseptic" precautions taken during the operation and subsequent treatment: the object throughout was to provide and maintain a carbolised atmosphere, as far as the appliances in hospital permitted. Secondly, to the counter-opening above the left groin, which allowed of a ready escape for discharge, for it may reasonably be supposed that but for some such provision mischief may have resulted from the retention of septic material. It will be observed that on the third day the dis-

charge had ceased, and the ligature used as drainage tube felt dry, the pulse simultaneously falling in frequency. Thirdly, to the semi-recumbent position of the patient, which tended greatly to favor that object.

It is also necessary to add that for ten days after the operation care was taken, by means of compress and bandage, to prevent the intestines from occupying the space left vacant by the removal of the tumour.

### ACUTE RHEUMATISM; PERICARDITIS PNEUMONIA; HYPERPYREXIA; DEATH.

By STEWART LOCKIE, M.D.

J. R. M.—, aged twenty-seven, with old acute curvature of the spine, commenced to have pain and stiffness in the knees and ankles on March 11th, 1876, but walked about at his occupation until the 13th, when he was obliged to stay in the house. Next morning the pains were much worse, and compelled him to remain in bed.

March 14th.—Evening: Was seen for the first time; has pain in knees, ankles, feet, and shoulders; there is slight swelling of right knee and ankle. First cardiac sound indistinct; no bruit. Temperature  $103.4^{\circ}$ ; pulse 136. To have fifteen grains of salicin every three hours.

15th.—Morning: Has had scarcely any sleep during the night. There is slight pericardial friction at mid-sternum. Temperature  $103.2^{\circ}$ ; pulse 136.

16th.—Morning: Had a better night, with some amount of sleep. Pain in the knees much better. Considerable pain in right wrist and hand. Has felt "a tightness" across the chest from an early hour this morning. Has a troublesome cough, with frothy expectoration. Pericardiac friction-sound marked, loudest over apex. Temperature  $101.4^{\circ}$ ; pulse 144. Urine of a dark sherry color, turbid, acid; specific gravity 1028; clears on first application of heat, then deposits a trace of albumen.—Evening: Cough less troublesome. Temperature  $103.7^{\circ}$ ; pulse 142; respiration 24.

17th.—Morning: Had a comparatively easy night. Joint pains much better. Transverse cardiac dullness increased; friction inaudible at apex, but heard at centre of cardiac area. Dulness and small crepitations over lower half of left lung. Temperature  $102.8^{\circ}$ ; pulse 144; respiration 26. Dose of salicin increased to twenty-five grains every three hours.—Evening: Has been very restless during the day, and is so still. Cough very troublesome. Temperature  $103.1^{\circ}$ ; pulse 150; respiration 26. To have fifteen minims of Battley's sedative solution of opium at once, the dose to be repeated if restlessness continues; to have also half an ounce of whisky twice during the night.

18th.—Morning: Took both doses of opium, and had some sleep, with intervals of delirium. There is present considerable nervous agitation, and the eyes have a wild appearance; slight lividity of countenance. There is scarcely any pain. Cardiac dullness the same as yesterday. Temperature  $104.6^{\circ}$ ; pulse 156; respiration 28. Blister over heart; whisky increased to half an ounce every two hours.—4.30 P.M.: Delirious. Temperature  $105.1^{\circ}$ ; pulse 144; respiration 32. To



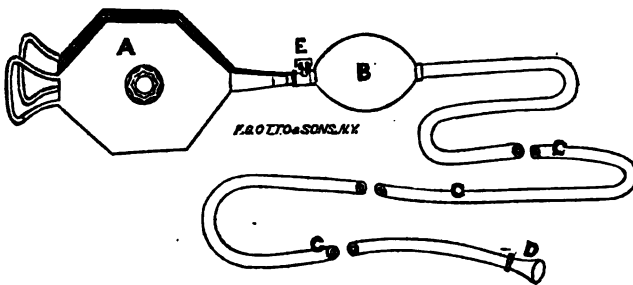
discontinue salicin, and to have five grains of sulphate of quinine. Anticipating a further rise of temperature, and as there was no bath in the house, a portable one was borrowed, and a porter engaged to convey it to the house.—8.50 P.M.: Is still delirious. Temperature 105.4°; pulse 144; respiration 38. Ten grains more of quinine were administered. To have half an ounce of whisky every hour. He was evidently sinking fast, and through some mistake the bath had not been brought. At 11 P.M. my assistant and I left him in order to see personally why the bath had not been sent. On our return the temperature was 107.1°; pulse very feeble. The bath had just arrived, and water was being poured into it, when the patient died. The temperature a few minutes after death was 107.1°.

I regret extremely that, through the negligence of the porter in not bringing the bath as ordered, we were unable to put in practice the remedy so successfully used by Dr. Wilson Fox and others in

two men at the top, and they were afraid to go down and render assistance; so the poor fellow was in this state when I happened to ride by, and, on asking what was the matter, was told all about it.

In a very short time I procured a long garden-hose, and, by good luck, in a cottage found a pair of bellows. I tied with a string the tube on the nozzle of the bellows, and threw the end of the hose down the well just above the dead man (for dead he was), and began pumping away, I may say, for dear life. I now sent a candle down, and finding the flame remained, I and another descended and lifted the poor fellow out. Every method was tried to restore life, but without success.

When I got home I set about inventing a something to prevent this sad loss of life to working men, and the result is the invention I offer to the notice of the profession; and as every village has its doctor, and every one, I should suppose, reads *THE LANCET*, it may thus become known that with this simple contrivance for pumping the atmo-



cases of rheumatic hyperpyrexia. This case shows, like some others that have been published, that when the temperature begins to rise to an unusual elevation there may be no time to lose.

Carlisle.

### A SIMPLE ATMOSPHERIC PUMP.

By ALFRED KING, M.D.

SOME years ago I remember being a few miles from London, and was told of a sad accident to a working man who had just lost his life in a well. The facts were these. The pump or well had been for some time wanting repairs, and the water that had been drawn off was found to be contaminated, and a man was sent down to clean and repair the well. He had not been many minutes down before he complained of foul gas, and asked for a lighted candle to be sent down to him. This was done, but it instantly went out; and about this time the man was seen to fall down insensible. His "mate" then descended, and, with a rope round the man's body, he, with the help of those at the top, lifted him out quite dead; and the other man had a very narrow escape, being assisted up in a half-dead state. This sad event made a deep impression on my mind at the time, and the other day a very similar accident happened on the road not many miles from my house. The case was very like the other one, with just this difference. The hole was near a very large gas pipe, and the place very foul; the man had only been down a very short time, when he was seen to fall by the

spheric air down and into any place I have described, the foul air is diluted, and for all the purposes of working this invention may be the means of (and this is the doctor's mission) saving lives. Balham.

## A Mirror OF HOSPITAL PRACTICE, BRITISH AND FOREIGN.

Nulla autem est alia pro certo noscendi via, nisi quamplurimas et morborum et dissectionum historias, tum aliorum, tum proprias collectas habere, et inter se comparare.—MORGAGNI *De Sed. et Caus. Morb.*, lib. iv. Proœmium.

### LONDON HOSPITAL.

ACUTE PERIOSTITIS OF TIBIA; SUPPURATION IN KNEE-JOINT, WITH SEPARATION OF UPPER EPIPHYSIS OF TIBIA; AMPUTATION OF THIGH; RECOVERY.

(Under the care of Mr. RIVINGTON.)

ELLEN W—, aged twelve, a very thin and delicate-looking girl, noticed, on September 17th, 1875, as she was getting out of bed, that her left leg was very painful, and on looking at it she found that it was swollen. It gradually increased in size and became more painful. She came to the

hospital on the 21st, and was admitted under the care of Mr. Reeves, who had charge of Mr. Rivington's wards. The temperature was 108° 8', pulse 124, and respiration 20. The patient was evidently very ill. A fluctuating swelling existed over the tibia, and an incision was made without affording much relief. On the 22nd she was sick, restless, feverish, and thirsty. On the 24th an incision was made over the crest of the tibia through the periosteum, giving exit to a large quantity of pus mixed with blood. The tibia was felt to be bare for three or four inches. The patient had previously had a rigor. She was much flushed and very thirsty. Her tongue was furred; pulse 130; temperature 100°; respiration 24.

On October 5th the patient complained of pain in the knee-joint, and Mr. Rivington, who had resumed the charge of his wards, ordered the limb to be placed on a McIntyre splint, at the same time enlarging the incision previously made to insure a freer exit for the increasing discharge. The temperature was 103° 4', and pulse 100. At this time there appeared to be little prospect of saving the limb. The constitutional disturbance was greater, and the patient was beginning to refuse her food. The knee-joint was swelling, and it was feared that either it had suppurated or it was about to become the seat of suppuration. The temperature was 103° 4', and pulse 100. Instructions were given for communication with the friends, and leave obtained for any necessary procedure. This having been done, a careful exploration of the parts was made on the 7th, the patient being placed under ether, which was administered by Mr. Boarse, the house-surgeon. The epiphysis of the tibia was found to be separating from the shaft, communication with the knee-joint established, and the soft parts with the periosteum detached for some distance from the tibia. Amputation was performed by Mr. Rivington at the lower third of the thigh, by means of a long anterior and a short posterior flap, chiefly consisting of skin and fascia, but with muscle towards the base. The elastic ligature was used, and very little blood was lost. The femoral and five smaller vessels were tied. Wire sutures were inserted to bring the flaps into apposition, and simple dressing was applied.

In reference to the progress of the patient, one or two remarks only are necessary. Although decidedly benefited by the amputation, both the pulse and temperature had a high range for some weeks. During the first few days the temperature varied between 101° and 103°. On the 14th it fell to 99°, and then for some time oscillated between that point and 101°. Normal temperature was not reached till the 24th of November. The pulse remained quick and weak for a long time, being accelerated from very slight causes. Locally the chief feature was necrosis of the lower end of the divided femur. A periosteal covering had been made for the bone, but about an inch of it lost its vitality; new bone was rapidly formed outside of the necrosed portion, and this latter began to show itself at the outer angle of the wound, the soft parts gradually separating and being separated, retracted by the action of the muscles. The necrosed portion was removed on the 4th of November. The patient sat up for the first time on the 18th November. The stump was looking well, and there was very little discharge. She gradually regained strength, and was allowed to go out at the beginning of last January. Since

her discharge she has been heard of, and the last report states that she has gained greatly in weight, and has become so plump and well that she would scarcely be recognised as the same person.

STRANGULATED INGUINAL HERNIA; OPERATION; RECOVERY.—STRANGULATED HERNIA; REDUCTION EN MASSE; OPERATION; RECOVERY.—CLINICAL REMARKS.

(Under the care of Mr. MAUNDER.)

For the notes of the subjoined interesting and instructive case we are indebted to Mr. E. J. Lawless.

William C—, aged thirty-four, was successfully operated upon by Mr. Maumder ten years ago for strangulated inguinal hernia of the left side. Since that time there has always been a small bubonocoele on the same side, enlarging occasionally, but always easily reduced by the patient himself. He wore a truss, but left it off on finding the hernia still descended behind it. On May 22nd, 1876, the hernia descended, while he was at work, two or three times. On each occasion he put his hand down, gave it a touch, and it went back, but he noticed that the tumour disappeared in a somewhat unusual manner; to use his own expression, "it went up with a bang, and so quickly that I thought my head was off." This reduction afforded him no relief; he soon began to vomit, and continued to do so all night. On the morning of May 23rd he applied to a doctor, who gave him some pills and a draught, both of which his stomach rejected. He was then admitted into the hospital.

On examination there was no tumour in the inguinal canal, and, with the exception of a large external ring, no evidence that a hernia had existed. The man lay extended in bed, complained of some discomfort in his left groin, and vomited occasionally. There was a scar at the site of the former operation. Mr. Maumder advised immediate exploration, and the man at once consented.

An incision about two inches in length was made just above and parallel to Poupart's ligament, and close to the scar of the former operation. The inguinal canal was quickly laid open, but no evidence of hernia could be seen until, on further dissection, a kind of pouch in the areolar tissue was opened. Here the structures were slightly oedematous, and the finger carried to the depths of the wound detected a firm resisting swelling occupying the iliac fossa. On holding the edges of the wound apart, and carefully cleansing it, an opaque, pearly membrane was seen—the sac. A small puncture was made in this, and several ounces of discolored serum escaped. The sac now became flaccid, and could be dragged readily out at the wound. It was then laid open, and a knuckle of highly congested intestine (strangulated twenty hours) was exposed, tightly constricted. The stricture was relieved in the usual way, and the bowel was returned into the cavity of the belly. A large extent of sac remained to be dealt with, and the greater part of this was cut away and allowed the neck to drop back into the wound. The incision was closed by suture, and a compress and bandage applied. Ordered to take calomel and opium freely; and should symptoms of peritonitis arise, venesection to be performed to ten ounces.

May 24th.—Passed a comfortable night, with the exception of an occasional vomit (chloroform).

25th.—Progressing favorably.

26th.—Bowels have been moved; the stitches have been removed, and some redness has appeared on the outer side of the wound. To take opium at longer intervals, to omit the calomel, and to have six ounces of wine.

30th.—The redness has disappeared, and the patient is doing well.

June 17th.—The patient is now convalescent.

*Clinical remarks.*—Mr. Maunder said that all who saw the patient must have been struck by the almost total absence of all local symptoms as well as by the non-existence of constitutional disturbance, with the exception of occasional vomiting. The man occupied a comfortable position as he lay extended in bed, and complained only of slight discomfort in the left groin. The patient was made to stand and cough, the result being negative. Neither bulging nor tumour could be detected, either by the hand or when the abdomen was examined in profile. It might also have seemed remarkable that no evidence whatever of violent taxis existed (neither tenderness, swelling, nor ecchymosis of the integuments), but this was strictly in accordance with the history of the reduction given by the patient himself. Now this was a most important fact to bear in mind in connexion with this lesion, and is one to which special attention had been drawn by Messrs. Luke and John Birkett, because, should the practitioner suppose that great force is necessary to effect reduction *en masse*, he may be deceived into discrediting his patient, and an operation which should be immediately resorted to may thus be fatally postponed. Mr. Maunder had, he said, operated on at least 120 cases of strangulated hernia, but this was the first case of the kind that had come under his personal care. The probable explanation of the lesion was this:—The necessity for the first operation arose from strangulation following the sudden descent of bowel into the funicular portion of the vaginal process of the peritoneum. This operation had led to obliteration of that process, while the tendency to hernia persisted. This persistence, meeting with an obstacle in the shape of a truss and agglutinated structures in the inguinal canal, led to the formation, by continuous pressure, of an *intraparietal* sac, which formed a nest for itself in the position where there was least opposition, partly in the canal, but chiefly in the iliac fossa. At the same time the opening into the peritoneal cavity, which had corresponded to the internal abdominal ring, had been pushed away from this, and lay deeply placed within the abdominal parietes.

latter wound being merely an abrasion. The boy simply wiped away the blood from his lip and went to his work, and did not apply for treatment until nine o'clock, when both wounds were cauterised, and the lip sewn up by Dr. Fletcher, of Broxbourne. After this the patient was seen by Dr. Fletcher three times, and the wounds healed within a week. The patient kept on with his work the whole time, and seemed quite well until Tuesday night, April 18th, when he appeared distressed, made a whining noise in his sleep, and frequently awoke with a start. He went to London sight-seeing on the following day, April 19th. During the day he seemed very sadly, and said he did not feel well, but could not describe his sensations except that he had no headache, and did not feel sick. In the afternoon he seemed to "catch his breath," and said he could not get his breath well. On his return from London he was at once taken to Dr. Fletcher, who ordered him to bed, and gave him a purgative powder. The bowels, which had not yet been open for two days, were relieved three times after the powder. He passed a very bad night, did not sleep; for, whenever he closed his eyes he was seized with "catching of his breath." Tried to get out of bed several times, but was restrained by his father, who was watching him.

On admission at 1 P.M. the cicatrix on the lip and the mark of abrasion on the arm were quite of normal appearance. He complained that the "wind took his breath away," and that when he closed his eyes he could not get his breath (both confirmed by observation). He complained also that froth kept coming up in his mouth, and the attempt to swallow this caused slight spasm. He felt thirsty, but did not like to drink because of the catching of his breath. Temperature 99·8°; pulse 90; respiration 24, regular, fully drawn and calm, except when the slightest current of air blew upon him. The catching of breath consisted in spasmodic action of the diaphragm; the clavicles were elevated so as to almost touch the lower jaw; the lips were drawn tightly over the teeth, and the corners of the mouth depressed; the eyes became quite prominent, and the pupils dilated, though not excessively. The aspect was quite calm except during a spasm, when it was painfully anxious. He talked quite rationally and plainly, and there was no change in tone of voice. He could not whistle, as the attempt at once caused a spasm. Some milk was taken by sheer determination, but caused immediate spasm, some of the fluid being expelled from his mouth, but the larger quantity was swallowed. He ate without difficulty, although the mere act of opening the mouth widely caused slight spasm. Tongue slightly furred on dorsum, but moist; no "lyssi" visible. Pupils rather dilated; there was slight reaction to light. Could close either eye with his finger without the slightest spasm or distress; but if, whilst one was shut, the other eye was closed, spasm was immediately set up. At 11 P.M. the temperature was 99·2°; pulse 92; respiration 40. Had dozed for a few minutes. Bowels rather relaxed; urine passed freely; abdomen tympanitic, and there was pain on pressure above pubes; priapism. Had taken some light pudding made with eggs and milk, and had also drunk some brandy-and-milk, but the effort to swallow fluid caused just as much spasm as before. Both pupils widely dilated. By ophthalmoscopic examination the media were found

## GENERAL INFIRMARY, HERTFORD.

### A CASE OF HYDROPHOBIA; ADMINISTRATION OF CHLOROFORM; DEATH.

For the following interesting notes we are indebted to Mr. William Odell, house-surgeon.

W. H. K.—, aged thirteen, was admitted on Thursday, April 20th, during Dr. Elin's week, with symptoms of hydrophobia, and the following history was obtained, partly from himself and partly from his mother. Whilst going to his work at half-past six o'clock on the morning of April 1st, a dog knocked him down and bit him through the upper lip and below the left shoulder, the

clear; the margin of the right optic disc not clearly defined; the vessels anastomosed on its surface and were increased in size; there was also pulsation of the retinal veins. The left disc appeared normal; there was, however, the same pulsation in the veins. The patient was continually obliged to get rid of the saliva by means of his pocket-handkerchief, as it annoyed him by accumulating in his mouth, and he did not swallow it for fear of spasm. Complained once that there was a lump in his throat and that he should be choked, but this feeling soon passed off; expression tranquil, except during a spasm.—12 o'clock (midnight): After lying perfectly quiet for some time he suddenly shrieked out and jumped out of bed into the nurse's arms, saying there was a pig in the corner of the ward. He was easily persuaded to get into bed, and thought no more of the fright and became perfectly quiet and collected until some new terror seized him. He was with some difficulty restrained when these attacks came on, tried to bite, kicked, and once, after promising to be perfectly quiet, attempted to strike with some fire-tongs which were near his bed. Subcutaneous injection of one-third of a grain of morphia had no effect. Chloroform administered.

April 21st.—2.30 A.M.: The patient has been under the influence of chloroform half an hour. Temperature 100.4°; pulse 120; respiration 24.—5.30 A.M.: Pulse 110; respiration 22. Character of pulse not materially altered, and, at first, it was rather improved by the chloroform; the respiration, however, was much shallower.—7 A.M.: Chloroform discontinued. During the night, directly there was the least approach to returning consciousness, the patient at once cried out in the same painfully shrill tone, and the mingled expression of rage and horror was indescribable. However, in the morning, after the effects of the chloroform had passed off, he remained in a perfectly quiet state, dozing from time to time, and eventually he regained consciousness and full possession of his senses. Said he did not want anything, and that he had had a nice sleep. Appearance perfectly calm; occasionally, however, his face flushed, his eyes became prominent, and the inspiration gasping.—8 A.M.: Temperature 100.6°; pulse 108; respiration 20. Tongue covered on dorsum with a brownish fur, had regained consciousness, and spoke rationally. He seemed, for the time, quite recovered from all violent action and spasm, and took some brandy, egg, and milk. Pulse of fair volume; pupils widely dilated.—12 o'clock (noon): Had been fairly quiet and quite sensible since eight o'clock; had taken a little custard-pudding, and a small quantity of brandy and water, which was brought at his own request; he also asked for water, but did not swallow above a few teaspoonfuls. By midday he became violent, and shrieked out in the same painful way. Chloroform re-administered.—2.30 P.M.: Pulse 108; respiration 26. Chloroform discontinued for a time, and for five minutes he remained quiet and sensible, spoke quite distinctly and rationally to his mother.—5 P.M.: If allowed to recover from the full effects of chloroform the patient answered questions, but not always correctly; on the return of complete consciousness he invariably started up in bed and shrieked out until fully under the influence of the anæsthetic. Complained of pain in the epigastric region.—8 P.M.: Pulse 132. A vapor bath which was tried did not in any way re-

lieve the spasm or facilitate breathing, although it caused the patient to perspire profusely.—8.30 P.M.: Temperature 102°; pulse 124; respiration 36. Much weaker.—11.30 P.M.: Still weaker, cried out directly there was the least approach to consciousness, but he seemed too exhausted to raise himself in bed, as he formerly did.

22nd.—1 A.M.: Died quietly, exhausted.

*Autopsy, forty-eight hours after death.*—Pia mater congested, as also was the whole brain; this congestion was most marked in the grey substance, so much so that on section it resembled very much the color of muscle. This was particularly evident on section of the corpus striatum and optic thalamus. The divided vessels (puncta vasculosa) were extremely prominent in the white substance of the brain. Choroid plexus very much congested. (The patient had been laid on his face directly after death, and remained in that position for twelve hours.) On examining the spine there was found considerable congestion of the vessels ramifying in the cellular tissue beneath the arches of the vertebrae, especially in the cervical region, and about the position of the fifth cervical spine was a gelatinous mass extending slightly upwards and downwards, lying between the dura mater and the arches of the spinal canal. The cord, medulla, and pons were sent to Dr. Lockhart Clark, who has kindly consented to examine and report thereon. Thoracic and abdominal viscera healthy.

## LIVERPOOL WORKHOUSE HOSPITAL

ANOMALOUS CASE OF NERVOUS DISEASE CONSISTING OF PROLONGED TRANCE WITH LOCALISED AUTOMATIC MOVEMENTS, TREATED BY ARSENIC; RECOVERY.

(Under the care of Drs. ALEXANDER and IRVINE.)

The following case is interesting, as well from its strangeness and rarity as from the peculiar combination of perfect rest of one part of the body with regular and constant movements of another part, the mind being all the time in a state of trance.

The patient was a boy aged ten years—a fact that, with the absence of any motive, and the long continuance of the symptoms, precludes the idea that the disease was feigned. Whether the movements gave him any pleasure or not it is impossible to say, but certainly their restraint irritated and annoyed him, even at a time when it was thought he had not many hours to live. It is interesting to note that recovery dated from, and was coincident with, the administration of arsenic, and that bromides, iodides, chloral, and chloroform seemed to have had no beneficial effect.

Patrick T—, aged ten, had always been a healthy child until November, 1875, when he became "feverish," and was admitted into the simple fever wards of the hospital. His fever did not present any specific character, and at the end of twelve days he was discharged well.

A few days after leaving hospital his mother says "he began to work with his hands and occasionally to scream," in consequence of which he was placed under the care of Dr. Bernard, from whose account the following notes were taken:—

When first seen the patient was lying on his back in bed, apparently perfectly unconscious, his eyes closed, the lids drawn tightly together, his whole body quite rigid. All at once he would jerk himself several times from the bed, kick his heels against any projecting object, and then relapse into his former state. It was at first thought that the symptoms might be due to worms, but as various anthelmintics had no effect, Dr. Bernard believed that they were due to irritation of the brain and spinal cord as a sequela of fever. Grey powder was given, and he improved so much that in six weeks he was able to sit up, the spasms having ceased, and consciousness having to a great extent returned. A few days after he was much worse. He was sitting up in bed perfectly still, with a blank and idiotic expression on his countenance. When touched he threw his arms straight out before him, and screamed very harshly. As his parents were tired of watching him, he was then transferred to hospital.

On admission January 28th, 1876, the boy lay on his back seeming altogether unconscious, his legs extended, their muscles, as well as those of the trunk and neck, being firm and rigid. His mouth was widely open, his eyes fixed, the lids slightly drooping; his face was sometimes flushed and sometimes pale. His arms lay naturally by his side, but the forearm, hand, and fingers were partially flexed, and in a state of constant and regular to and fro movement, so that the patient kept beating his chest with his knuckles at the rate of about sixty times a minute. His legs were so rigid that it was impossible to flex them forcibly, and when the movement of his hand was restrained, a peculiar fretful expression appeared on his face. He made no attempt at speaking or crying. Pricking, pinching, tickling, and faradisation produced no visible effect, except that when the latter was applied to the muscles of the neck the patient moved his head and made a slight noise. During sleep (of which he had very little), and under chloroform, the muscles of the legs and trunk relaxed, and the arms ceased to move. Pulse, tongue, and temperature normal; bowels constipated. Patient paid no attention to the wants of nature, but he readily swallowed the food that was put into his mouth. He was treated with bromide of potassium, iodide of potassium, and chloral at various times, with, occasionally, laxatives and laxative enemata.

From his admission up to the 1st of March the patient gradually sank, became more and more emaciated, and refused to swallow food, which was administered by enemata. Even then the rhythmical movements of the arms persisted, although much feebler than before, and when they were restrained his eyes alone expressed his annoyance, as he did not seem equal to the effort of frowning. A little before this, on Feb. 26th, three minims of the solution of arsenic were prescribed three times a day. On March 1st he began to swallow better. On March 2nd, for the first time since his admission, he turned on his left side during sleep, and next day he showed his returning consciousness by being fretful. His bowels now became very much constipated, and were relieved by the faradaic current when laxatives and enemata had failed. During the next three weeks the patient gradually became more conscious, and the rigidity of the lower limbs slowly disappeared.

His convalescence to bodily strength was at this time much retarded by a short spasmodic cough not explained by stethoscopic examination. On March 11th, on account of his antipathy to swallowing his medicine, the arsenic was injected subcutaneously, and, as it produced no irritation, this mode of administration was continued up to the end of the case, the quantity being gradually increased to ten minims three times a day. As he grew stronger, the movements of his arms increased in extent and force for some time, and he now screamed when they were held. Cutaneous sensibility returned with the improvement in his health, and before the end of March he began to "notice" his attendants. About the middle of April, the motion of the arms began to intermit, especially when his attention was diverted, as during meals, &c. On April 28th, the arms were extended and bandaged to straight splints. He struggled slightly with these at first, but when they were removed, on May 8th, the movements did not recur. In a few days he was able to feed himself and attend to himself generally. On May 10th he began to walk, but as he had never yet spoken except for about three days at the beginning of March, when he called incessantly for water, the continuous current was applied to his neck and tongue. His recovery now advanced rapidly in every direction, and on June 7th he appeared in good health, ate and slept well, could play dominoes successfully with the other boys, and seemed as intelligent as any ordinary boy of his age.

## KING'S COLLEGE HOSPITAL.

### CASES OF CLEFT PALATE.

(Under the care of Mr. HENRY SMITH.)

THE following cases, which have been recently under treatment at this hospital, illustrate the great benefit that may be obtained, even in severe cases of cleft palate, by the adoption of Sir William Fergusson's admirable device of splitting the hard palate.

CASE 1.—E. J.—, aged eight years, a miserably under-fed boy, was sent into the hospital on Sept. 11th, 1874. A hare-lip had been previously operated on. A cleft extended through the soft and hard palate, about one-third of an inch wide; the alveolar ridges were entire, and the vomer was slightly attached to the right edge of the cleft. The soft palate was fleshy.

He was allowed to remain in the hospital to improve his health, and on the 19th Mr. Smith operated on the soft and hard palate after the method recommended by Sir William Fergusson, by dividing the levator palati muscles, paring the edges of the cleft, and prising the bones together, by splitting the hard palate on either side, and introducing sutures through openings made in the bone by an awl.

The boy got severe constitutional disturbance, and the hole reopened in a few days. He was allowed to remain in the hospital for another month, by the end of which period the mouth had got into a healthy condition, and the boy himself had greatly improved. The operation was repeated both on the soft and hard palate on Nov.

17th. Excellent results took place, the entire palate, except a very small hole in the hard, firmly uniting in a few days.

CASE 2.—H. J.—, aged nineteen, admitted Sept. 16th, 1875, with cleft through the hard and soft palates extending to within a short distance of the alveolar ridge. It was very wide, and the soft parts were thin. The general health was but poor. The patient had previously consulted a surgeon to a metropolitan hospital, who refused to interfere, probably because Sir W. Fergusson's operation on the hard palate had not then been made known.

Mr. Henry Smith operated on Sept. 20th, under chloroform. The levator palati muscles were divided; the hard palate split on either side, the bones prised together, and the parts united by sutures. Everything went on well; perfect union took place, and the patient was discharged on Oct. 19th, already improved in his speech.

CASE 3.—B. B.—, aged forty-eight, admitted into King's College Hospital April 22nd, 1876, with an enormous cleft extending all through the soft and hard palates, for which he had worn a cumbersome and expensive apparatus for many years. He was desirous to have a portion even of the opening closed if possible. Mr. Henry Smith determined to try to close the soft palate, but declined to interfere with the hard, on account of the man's age. Other surgeons had been consulted, and they all discountenanced any operation.

Mr. Henry Smith operated on April 29th, dividing the levator palati muscles and closing the soft palate. There was great hæmorrhage during the operation and considerable subsequent prostration, partly from the loss of blood and partly from the effects of the chloroform; but the patient soon rallied, and the parts took on healthy action. At that part of the gap where there was the greatest strain one of the stitches ulcerated, but the greater portion of the soft palate united in a satisfactory manner, so that the man could wear the simplest apparatus.

In the first two cases we have examples of the excellent results produced by the method proposed by Dieffenbach, and more recently adopted quite independently by Sir William Fergusson, of closing the hard palate by freely splitting the bone on each side, combined with the free division of the levator palati muscles.

The first case is especially interesting, as it shows that, although a complete failure may have taken place, the operation may be successfully undertaken a second time, even within a few weeks. As the two operations were performed by the same surgeon, it may be presumed that the same care was taken on both occasions; the failure was doubtless due, in great measure, to the weak state of the boy's health.

In the second case matters were not very encouraging for an operation; the cleft was very extensive, the soft parts were thin, and the patient was by no means in average health. The operation was, of necessity, long and exhausting, yet excellent results were obtained.

In the third case the chief element of interest is the age of the patient in connexion with the operation; for it is here shown that even in a person near fifty an extensive gap in the soft palate may at least be closed after division of the levator palati muscles.

## CHARING-CROSS HOSPITAL.

### CASE OF ACUTE RHEUMATOID ARTHRITIS.

(Under the care of Dr. POLLOCK.)

C. H. P.—, aged twenty-nine, admitted December 2nd, when the following notes were made:—Was a clerk in a public institution, where the hours were long and the work was heavy. He had often written over twelve hours a day. Five years ago he had an attack of acute rheumatism (at least so it appeared), but without any heart affection. Said he never had syphilis or gonorrhœa.

On the 16th of September last he had an attack of "rheumatism," first affecting the middle joint of the right ring finger, the right knee and foot. He also stated that he had some affection of his eyes, which caused temporary blindness. He was laid up for two months, during which time the right knee was much swollen, and became partly flexed owing to contraction of the tendons; but it subsequently straightened again. The condition of the right hand was as follows:—At first the first interphalangeal joint of the ring finger became painful; then that of the middle finger, and finally that of the index finger. The pain was accompanied by much swelling. At the end of two months all the pain and swelling disappeared, except from the hand, but the knee-joint remained somewhat stiff.

On admission, the right hand presented the deformity characteristic of rheumatoid arthritis. The metacarpo-phalangeal joints, with the exception of that of the little finger, were stiff, painful, and swollen; the fingers were markedly turned to the ulnar side of the hand. The pain was especially bad at night. The patient did not perspire at all. The tongue was coated, the bowels rather costive, urine natural, appetite pretty good. Heart and lung sounds normal. Temperature normal. Ordered fifteen drops of colchicum wine, five grains of iodide of potassium, and equal parts of chincona and rhubarb and potash mixture, three times a day, and an alkaline lotion to be applied on lint to the knuckles of the right hand.

In a few days he was somewhat better. Tongue cleaner; knee quite well. Ordered six drops of diluted sulphuric acid, three grains of sulphate of iron, and six grains of sulphate of quinine, three times a day. To continue the alkaline lotion, which seems to give great relief. The swollen joints to be painted occasionally with iodine liniment. The right hand to be kept absolutely at rest.

Dec. 19th.—Much better. Left the hospital by his own desire.

On Dec. 21st he was re-admitted. The metacarpo-phalangeal joints of the right hand were worse, more swollen and painful. He thought he had caught cold. Tongue a good deal coated, and bowels confined. Ordered a mixture containing ammonia, rhubarb, and potash, three times a day. To go on with alkaline lotion.

27th.—Somewhat better. To take the iron and quinine mixture again.

Jan. 11th, 1876.—The swelling has greatly diminished in the inflamed joints, and the pain has nearly gone. He can write pretty well now. Joints to be painted with iodine liniment.

14th.—Discharged at his own wish, very much better.

Upon leaving the hospital he returned to his employment as a clerk, but soon found that the amount of writing was more than the hand would bear, and after a while the joints threatened to become inflamed again. Acting under advice, he resigned his clerkship. For nearly two months he had no employment, and was able to give the right hand complete rest, continuing to paint it with iodine, and to take the iron and quinine mixture. During this period the hand got pretty nearly well, the fingers lost their inclination to the ulnar side of the hand almost entirely, and nothing but a slight thickening or nodosity of the metacarpophalangeal joint of the index finger remained. He subsequently obtained a clerkship at one of the Civil Service stores, where his duties did not involve excessive writing, which appointment he has now held for nearly two months, the hand remaining well.

*Remarks.*—With reference to this case Dr. Pollock observed that acute rheumatoid arthritis was not a common disease. Rest was of great importance in the treatment, the joints always becoming more inflamed after much movement. As soon as the digestive organs will allow, there is no treatment so successful as the administration of large doses of iron and quinine for a lengthened period, which should be given directly after meals, and never on an empty stomach. The alkaline lotion, and subsequently the iodine paint, would seem to have been of considerable service.

### BRADFORD INFIRMARY.

ULCERATIVE MYOCARDITIS, ENDOCARDITIS, PERICARDITIS, AND DOUBLE PLEURO-PNEUMONIA.

(Under the care of Dr. REGINALD ALEXANDER.)

ELIZABETH B—, a housemaid, was admitted at the request of Dr. Bronner, April 10th, 1875. There was nothing worthy of note in either her family or personal history, having enjoyed good health until a month ago, when she began to suffer from pains in the shoulders, which becoming worse, confined her to bed for a week. About the 1st of April she first began to notice shortness of breath and pain of a clicking character over the lower part of the sternum. On admission she complained of pains in the shoulders, and over the whole of the cardiac region there was pain, which was increased by the pressure of the stethoscope. She could not lie on the left side on account of dyspnoea, which came on when she attempted to do so. Severe hacking dry cough also troubled her. The pulse was rapid and of small volume. The heart-sounds were replaced by bruits both at the apex and base. The double murmurs at the base were best heard in the situation of the aortic valves and along the course of the great vessels, especially at the right sterno-clavicular articulation. The cardiac dulness was much increased in every direction. Urine acid, sp. gr. 1028, no albumen. Ordered beef-tea and milk diet, and an alkaline diuretic mixture containing tincture of digitalis. Poultices to be applied to the cardiac region.

April 12th.—Feels much better. Dulness in the cardiac region not so great. A good deal of ar-

terial excitement. Evening temperature 104°; pulse 124; respiration 44 per minute.

18th.—Arterial excitement less; is sweating profusely. Morning temperature 101.4°; pulse 107; respiration 48. Evening temperature, at 7 P.M., 104°; pulse 124; respiration 42. At midnight, temperature 99.6°; pulse 96 (after the ice). Complaints of great heat and thirst. Ordered ice to suck.

14th.—Has passed a good night. Cardiac dulness less; no friction fremitus. Morning temperature 101.4°; pulse 122; respiration 38. Evening temperature 100°; pulse 94; respiration 38.

17th.—The endocardial bruits more distinct.

19th.—Pain in various parts of the body, and had severe jumping pain yesterday in the cardiac region. Morning temperature 105°; pulse 120; respiration 47. Evening temperature 104°; pulse 114; respiration 41. The blistering fluid applied to-day to the cardiac region. Ordered quinine mixture and digitalis.

26th.—Has had no special symptoms during the last few days, but the cardiac dulness is increasing, and the patient has vomited her food occasionally. The number of respirations per minute has increased to beyond 50.

28th.—Sweating profusely. Pneumonic complication has been suspected for the last few days, but the patient's condition precludes examination of the chest. She can scarcely bear anyone to approach her.

May 1st.—2 P.M.: Severe rigors. 2.45: Temperature 104.5°; pulse 124; respirations labored.

2nd.—Feels better this morning. Pulse and temperature more favorable, but she cannot take food, and during the day rigors returned, respirations increased to 70, the face became livid, and she died at 8 P.M.

*Autopsy* was made by Mr. T. C. Denby. Heart's walls soft; narrow ante-mortem clots in aorta; traces of fibrinous deposit on one section of mitral valve. Posterior section of aortic valve disappeared, and its place occupied by large fibrinous deposits of ragged and irregular character. At the root of this valve was an aneurismal pouch, the size of a walnut, the interior of which was divided into small compartments, one of them projecting into right auricle, just above tricuspid valve, its wall being very thin. About eight ounces of pericardial fluid. Right lung adherent closely in whole extent of pleura, in a state of red hepatisation from base to apex. Left lung incompletely hepatised; adherent to pleura; both lungs very small. Pleuritic fluid in moderate quantity.

*Remarks.*—The patient's illness was characterised by frequent attacks of great irritability of temper, and she could not at times bear the approach of anyone to her bedside, in consequence of it increasing the heart's action, and her agonising dyspnoea and pain.

### HOPITAL ST. LOUIS, PARIS.

CASE OF EPITHELIOMA OF THE NOSE; OPERATION; RECOVERY; DEATH THIRTY-THREE DAYS AFTER OPERATION.

(Under the care of M. PEAN.)

A. M—, forty-two years of age, servant, was admitted on the 31st January, suffering from a tu-



mour situated at the root of the nose. Her father died quite young, but her mother is still alive and well, and is sixty-three years of age. Her brothers and sisters all died of pulmonary affections. The patient herself was mother of twelve children, ten of whom were then alive. She said she had never been ill before, and denied all history of syphilis.

Eighteen months prior to admission she noticed that she frequently bled from the nose, and that when she made use of her handkerchief she found clots of blood in its folds. These symptoms were not accompanied by pain of any sort. Shortly after this she began to experience some difficulty in breathing through the right nostril. She then consulted M. Péan for the first time, and a polypoid mass was withdrawn from the interior of the right nasal cavity. From that day the bleeding became more frequent, and only stopped when she became *enceinte* for the last time. After her confinement she noticed that she had a swelling at the upper extremity of the nose, situated on the right side. The tumour continued to make slight progress during six weeks, when she applied for the second time at the hospital.

Upon entering the hospital, the patient seemed greatly reduced in strength, owing to the frequent loss of blood. She complained of very severe headache, which troubled her mostly at night. She had grown considerably thinner, but her appetite was still good, as was also her digestion. Her courses had not returned since her last confinement. The secretion of liquid by the lachrymal gland was increased on the right side, but there was no functional disorder of the sight. Nasal breathing had become very difficult, and the patient was obliged to breathe almost exclusively through her mouth. The tumour had invaded the whole of the upper half of the nose, and protruded to the right, where it formed a mass about the size of a pigeon's egg. The skin was tightly stretched and was very vascular, presenting a shiny appearance.

Feb. 5th.—An operation was performed. An incision was made down each side of the nose, that on the right being made to pass as near the internal angle of the right eye as possible; a transverse incision joined the two lateral ones just above the inferior extremity of the organ; the bones proper to the nose were cut away, as also the inner wall of the nasal fossa, and the tumour was found to extend back as far as the posterior orifices of the fossa; the mucous membrane was detached in its whole extent. Very little hæmorrhage occurred during the operation, and what little did occur soon stopped of its own accord.

6th.—The patient passed a good night, and said she felt very comfortable. Wound bled slightly while it was being dressed. Temperature: Morning, 38.2°; evening, 38.4° C.; (100.8° and 101.2° F.) pulse 90.

7th.—Morning: Temperature 38° C. (100.4° F.); pulse 85. She continued to feel well; had no symptoms of any brain-disorder; constipated. Evening temperature 38.2° C.

8th.—Temperature 38°; pulse 85. The patient slept well and had a good appetite; tongue very clean. From this time she continued to improve without a bad symptom; her strength had increased considerably, and she had grown fatter. On March 9th she left the hospital, but was instructed to come every day to have her wound dressed.

On March 10th, whilst on her way to the hos-

pital, she suddenly fell down in the street and was brought into the hospital on a litter. Upon examination she was found to be almost completely paralysed. Speech was impossible. Her face was of a pale ashy hue, presenting the aspect of death. There was a slight hæmorrhage from the wound. The heart-sounds were almost inaudible and the pulse imperceptible. Two hours afterwards she died.

*Autopsy, forty-eight hours after death.*—A prolongation of the tumour was found in both frontal sinuses. Their posterior walls were perforated, and pressure was being exercised on the anterior lobes of the brain. In the liver there were found several cancerous deposits, as also in the right kidney. The heart was hypertrophied, and was the seat of fatty degeneration.

## WESTMINSTER HOSPITAL.

### PARALYSIS FOLLOWING A BLOW ON THE HEAD; RECOVERY.

(Under the care of Mr. DAVY.)

For the following notes we are indebted to Mr. George F. Poynder, house-surgeon.

Philip L—, aged forty-nine, was admitted into Henry Hoare ward on June 20th, 1876, at 7:30 p.m. The account of his accident was as follows. In the evening, about an hour before admission, the patient was walking down the stairs of the Underground Railway, when his foot slipped on the brass edging of the steps, and he fell about twenty steps, striking his head, face, and left shoulder. He had been drinking before the accident, but was able to walk without staggering. He was stunned by the fall, and when he recovered consciousness he found himself being carried through the streets on a stretcher.

On admission he was sensible; complained of pain in left shoulder; pupils dilated; breath smelt strongly of alcoholic liquor; face drawn to the left; tongue protruded to the left; able to move both legs—right rather more freely than left; pulse normal; slight graze and bruising of scalp on upper and back part of right side of head; bruise over spine of left scapula and over crest of left os innominatum. At 10 p.m. he seemed better; protruded his tongue in a straight line. Got out of bed during the evening to micturate, but fell down and had to be raised. Had no difficulty in passing urine. Did not know what caused him to fall, except that his legs seemed to give under him.

June 21st.—Feels much better, but did not get much sleep through the night. Pupils normal; tongue protruded in a straight line; bowels open; able to walk across the ward; face still drawn to the left, but not so markedly as yesterday, not noticed by patient when he looked at his face in a glass; able to move his forearm on his arm, but cannot lift his arm from the side without assistance; can grasp pretty well with his left hand, but not nearly so firmly as with the right.

22nd.—Slept well; moves forearm a little more freely than yesterday; bowels acted; tongue clean.

23rd.—Feels better; able to raise arm from side, when he starts it by raising the elbow slightly with the other hand; bowels open twice.

24th.—Better again this morning; slept well.

Pulse 80. Able to raise his arm over his head to-day slowly without any assistance from the sound arm.

25th.—Able to raise the arm more easily to-day, but still suffers slight pain in the shoulders when he moves his arm.

27th.—Patient was up for a short time yesterday, and felt all the better for it. Is able to grasp with the left hand almost as well as with the right.

28th.—As the patient was anxious to return to his work he was discharged. He was not able to move his arm quite so freely to-day, as it feels stiff—caused, he thinks, by his sleeping under one of the ward windows without a flannel shirt,—but he is able to use the affected arm as readily as the sound arm for ordinary purposes. Face still slightly drawn to the left, but not noticed by himself.

*Remarks.*—The speedy recovery made by the man from the commencement is curious, as it began very soon after the time that he regained consciousness, and steadily continued till his discharge from the hospital. The diagnosis was that pressure had existed probably at the floor of the fourth ventricle, and in the vicinity of the right corpus striatum, the gradual subsidence of which was coincident with his speedy improvement.

### LEEDS INFIRMARY.

#### GENERAL OXONIC SPASM; TREATMENT BY CONIUM.

(Under the care of Dr. CLIFFORD ALLBUTT.)

M. E. W—, aged twenty-six, was admitted into the infirmary on May 1st. She had lost her mother, and was an only child. After making inquiry she stated that no near relation had ever been affected with epilepsy, chorea, or other nervous disease. She had occasionally suffered from frontal headache, which laid her up for two or three days, but had had no serious illness. Her occupation had been that of working a sewing machine.

About three months ago she began to start suddenly: in the day this occurred about once an hour, but at night she had fits of shaking lasting about an hour. The attacks in the day grew gradually longer, and at the period of admission lasted about an hour and a half. Those at night, generally three or four in number, lasted about an hour. Three weeks after the commencement of these attacks she was married.

The attacks began with a fluttering sensation in the epigastrium lasting a few seconds; then the whole body began to shake. The muscular tremor seemed greater in the back, but she could hold her hands pretty steady. When she laid on her side the abdominal muscles were lax, but when on her back the abdomen was tense, the thighs partly flexed, and the flexors working strongly. She complained of severe pain in the left hypochondrium, under the edge of the ribs, during the attacks, and there was some tenderness, on pressure, over the end of the last rib. On admission the attacks came on about every hour. Her general health was good. Catamenia regular up to two months ago.

May 2nd.—In the evening she took six drachms of the juice of conium.

3rd.—Had a similar dose this morning. She slept better, but has had four attacks this morning. The conium affected her distinctly, making her feel tired and inclined to sleep. Took one ounce of the juice at 2 P.M., and remained quite quiet till 11 P.M., when she had another attack and took another similar dose.

4th.—Took one ounce of the juice in the morning and six drachms at night. She had three attacks before 10 A.M., and was then quiet till 5 P.M., when she had an attack lasting only thirty minutes.

5th.—Took the conium as yesterday; had no attack in the night, but suffered at 6.10 and 12 A.M. and 6 P.M.

6th.—Had an attack at 6 A.M., and took six drachms of conium.

8th.—Has had no further attack. Some little pain in left hypochondrium, with tenderness over two dorsal spines, was relieved by a blister over the tender part of the spine.

11th.—Has had no attack since the 6th. Is somewhat weak and anæmic, but feels stronger than on admission; sleeps well, and is free from pain; can now work a sewing-machine without uneasiness. Discharged.

The patient was seen a fortnight later, and had had no return of the attacks.

### WEST LONDON HOSPITAL.

#### STRICTURE OF THE URETHRA AND PERINEAL FISTULÆ; INTERNAL URETHROTOMY; PERMANENT CLOSURE OF FISTULA THREE DAYS AFTER OPERATION.

(Under the care of Mr. TEEVAN.)

E. H—, aged twenty-six, miller, of thin and dejected appearance, was admitted into the hospital on May 9th, 1876. The patient stated that he had an attack of gonorrhœa nine years ago, for which he took medicines, and that he was afterwards long troubled with a gleet. About eight years ago he noticed that the stream of urine began to get smaller, and that he had to strain during micturition. He then commenced to suffer from frequent attacks of retention of urine, which were relieved by the catheter. One year and a half ago the perineum began to swell, an abscess formed and burst, and the patient afterwards passed nearly all his urine through the fistulæ which remained. On examination a tough stricture, only admitting a small catheter, was found four inches and a half from the meatus externus. There were also three ring strictures of large calibre in the penile urethra. The centre of the perineum was much indurated, and in the raphe were two fistulous openings about one inch apart from each other.

On May 10th Mr. Teevan passed a small elastic olivary catheter and left it in for fifteen hours: its retention produced much soreness and discomfort. On May 23rd he divided all the strictures from before backwards, and having passed a No. 26 bougie, to show that all the urethra was clear, he immediately withdrew it. The patient had no rigor nor bleeding after the operation, and three days later the house-surgeon (Mr. Alderton) reported that the passage was quite water-tight. The patient was then allowed to get up and go about. On June 1st, 4th, 7th, and 10th No. 25

metal bougie olivairo à ventre was introduced. The man was afterwards taught to pass a large olivary catheter for himself, and on June 14th left the hospital quite well.

Mr. Teevan remarked that the case showed what internal urethrotomy could achieve, and he was not aware of any other means which could have effected the desired object in so short a period. The chief stricture was of too chronic and indurated a character to have been successfully enlarged to the size it had been without causing much pain and local irritation, and he had therefore divided all the contractions. As a rule, fistulae would rapidly close if the strictured urethra were enlarged to its normal diameter; but if nothing bigger than a No. 12 English was aimed at, disappointment, he alleged, would probably result, as the canal was only half opened up. The action of the operation was purely mechanical. The fistulae were kept open by the obstruction in front of them not allowing the urine to escape, and distending the urethra posteriorly with great force. So soon as the obstacle was removed, the openings quickly closed of their own accord. It was of great importance to pass a very large instrument after the operation to show that the work had been thoroughly done, and in the present instance he had introduced No. 26, which lay quite loosely in the urethra when passed.

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## Editorial.

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### A RARE FORM OF ABDOMINAL TUMOUR.

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TUMOURS composed of unstriped muscular tissue are occasionally met with elsewhere than in the uterus, where they are so familiar to everyone. They may arise from any part of the alimentary canal, taking as their starting-point the muscular walls of the oesophagus, stomach, or intestines; but in these regions they seldom attain any very large size, appearing mostly as small polypoid growths beneath the mucous membrane. The following case, recorded in the current number of *Virchow's Archiv* (v. lxxviii, p. 227), affords many points of interest and rarity. Here the growth, arising from the stomach as a simple myoma, became the seat of sarcomatous growth, a grafting of malignancy upon a simple neoplasm which has before been noticed in regard to uterine fibroids. The tumour, it will be seen, attained an enormous size, and, what is even more remarkable, the author states that the secondary nodules found in the liver exhibited also the microscopical characters of plain muscular tissue intermixed with sarcomatous cells. He confesses that this rare exhibition of metastasis on the part of true muscular fibre is almost unique in pathology, but he refers to one case published in the fifty-fifth volume of the same *Archiv* by Eberth, in which a (probably

congenital) "myo-sarcoma" of the kidney was accompanied by the dissemination of secondary knots in the diaphragm. The present case is related by Prof. Brodowski, of the Pathological Institute of Warsaw. The patient, who was much wasted and was suffering from shortness of breath, was a man fifty-seven years of age, who was admitted in February into the surgical clinic under the care of Prof. Kosinski. The abdomen was as large as that of a woman in the seventh month of pregnancy, being occupied by a large, well-defined tumour passing obliquely from the left hypochondriac to the right iliac regions, its lower margin being three fingers' breadth below the umbilicus, whilst above its limits were lost in those of the liver. The tumour was slightly movable, its surface for the most part smooth and resisting, but at one spot a prominence could be felt, which distinctly fluctuated. The man's history was that at the age of twenty-five he had suffered from intermittent fever, from which he had completely recovered; at the age of forty-six he had enteric fever, but he did not exhibit any gastric symptoms until within three years of the present time, when he began to experience a sense of weight at the epigastrium, with pain in the left side, and constipation. One year later a tumour was found in the abdomen, and at that time it was considered to be a chronically enlarged spleen, a diagnosis which was later replaced by that of hydatid tumour of the same organ, as the growth increased so as to fill two-thirds of the abdominal cavity. Prof. Kosinski, however, after careful examination, concluded that the growth arose from the omentum; and, having punctured the fluctuating swelling, obtained therefrom a quantity of blood-stained serum, in which some flocculent material was suspended. Microscopical examination of this material showed it to consist mainly of red blood-corpuscles and nucleated spindle-cells. The tapping afforded temporary relief, but the patient shortly succumbed. On post-mortem examination, the abdomen was found to be almost wholly occupied by an oval tumour, twelve pounds in weight, and about twelve inches in length by six inches in breadth. It was attached to the greater curvature of the stomach, and lay between the folds of the omentum, which was stretched over it, and in places adherent to it. The whole tumour was riddled with cavities varying in size from a walnut to a foetal head, all containing fluid similar to that obtained by the puncture *intra vitam*; the walls of these cavities being ragged, and beset by patches of a dark-red color covered by small greyish-red granulations. Internally the mucous membrane of the stomach presented an ulcer on its larger curvature the size of the palm, having the prominent everted margins and other characters of a cancerous ulceration. The liver contained several well-defined nodules, the largest being of the size

of an apple, some of which were softened and resembled the primary growth in appearance. The lymphatic glands were not infiltrated, and the remaining abdominal viscera were simply anæmic. The microscopical characters of the primary growth were those of a myoma—i.e., interlacing bundles of plain muscular fibres, largely intermixed, however, with spindle and stellate cells. It appeared as if the stromal connective had become the seat of sarcomatous growth, by the degeneration of which the cavities described had been formed. The masses in the liver also presented the same myo-sarcomatous characters, some of them being in places composed wholly of sarcoma tissue. Prof. Brodowski believes this to be the largest myo-sarcoma of the stomach upon record, and draws attention to the fact that in the tumour itself the muscular tissue preponderated to a very large extent, justifying the inference that the growth was originally a simple myoma, that it had then become the seat of sarcomatous infiltration which involved the submucous tissue of the stomach, and which, by its rapid evolution and degeneration, had caused the great and speedy increase in the size of the tumour noticed during life.

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#### DR. MARION SIMS'S ADDRESS.

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DR. J. MARION SIMS, in his Anniversary Address before the American Medical Association, delivered in Philadelphia, touched on several topics which have excited, and will probably continue to excite, a good deal of attention on both sides of the Atlantic. On an occasion like a Centennial celebration, where people come together for the patriotic purpose of joining in it, for scientific discussion and for social communion, a certain amount of mutual admiration may be both anticipated and pardoned. And in the case of America the change that a century has produced is truly marvellous. Brief as that period is in the life of a nation, the population has increased in that time, Dr. Marion Sims tells us, from three to more than forty millions, and all the time that the nation has been growing and developing in this way it has had to encounter and surmount the diseases, if we may so express it, incidental to the infancy and growth of a nation, no less than of an individual. The Americans of to-day rival the greatest nations of the earth in commerce and manufacture; for a hundred years has their form of Government continued, and they have, in that time, survived the fiercest civil war, and a series of experiments and fermentations enough to have caused a disruption of society. In addition to the effects of the civil war, the extension of the suffrage to the slave

population has taken place, together with the absorption of millions of uneducated immigrants, to whom the suffrage has also been given. The Americans are making a name, too, in science, literature, and art; and to their energy there is no end. But to Dr. Marion Sims's address. After dwelling on such subjects as their code of medical ethics, which he thinks requires to be broader than it is, to adapt it to the exigencies of modern society; on medical education, and the evils attendant on the multiplication of medical colleges and private corporations running in competition with one another, from which no hope of reform can be expected; he passes to the question of State Medicine and Public Hygiene, and boldly addresses himself to that section of it which deals, or rather should deal, with the prevention of the spread of syphilis. We should have been glad to see the subject of the treatment of the insane in America alluded to, as it is one of extreme importance, and we shall ourselves take an early opportunity of commenting on it. So far as the well-being of the human race is concerned, Dr. Marion Sims looks upon the subject of syphilis in the same light as Dr. Samuel Gross does—namely, as the great question of the day. It is no longer, he contends, a question for the therapist, but one for the sanitarian, the philanthropist, and the statesman. "A greater scourge than yellow fever and small-pox combined is quietly installed in our midst, sapping the foundations of society, and poisoning the sources of life." Instead, however, of the legislation that looks to licensing prostitution, as in France, or the partial legislation of the Contagious Diseases Acts of England, he thinks we must manage to control the men who are likely to import the poison, while we obtain control over the women who assuredly disseminate it. And this may be achieved by an application of the two following propositions: a system of sanitary inspection and control that will prevent the importation of syphilis from abroad, together with another and similar system for detecting and taking charge of the subjects of syphilis at home. The existing boards of health in the various cities should have the same power over syphilis that they now have over cholera, small-pox, and yellow fever. In other words, syphilis should be included in the great family of contagious or communicable diseases, and subjected to the same laws and regulations. Simple as the application of these principles of action may appear theoretically, and easy as their application might be made, according to Dr. Marion Sims, in America, we venture to doubt whether the strongest government in this country would undertake the task; but, be that as it may, we have said enough to prove that the control of the spread of syphilis is regarded among the medical profession in America as one of the most important questions of the day.

## Medical Annotations.

"Ne quid nimis."

### OSTEOTOMY IN FRANCE.

A LONG discussion lately took place at the Société de Chirurgie of Paris, on the subject of osteotomy in the treatment of rickety deformities, during the course of which the opinions of many French surgeons were elicited. M. Jules Boeckel, of Strasburg, described thirty-four cases of osteotomy, performed in some cases for rickets, in others for extreme deformities from other causes, and in all the operation was successful. The most promising age he concluded to be from fifteen months to seven years, after, of course, the deformities have become fixed, and treatment by other means has become impracticable. The method recommended by M. Boeckel is to place a chisel in an opening made through the skin and periosteum, and divide the bone by a few blows with a mallet. He prefers to complete the section of the bone at the time—not, as some surgeons have recommended, to allow the wound to heal, and then to complete the division by external violence. After the section the limb is, of course, kept immovable by a plaster bandage. In some cases the removal of a wedge of bone was necessary. M. Alphonse Guérin pointed out that osteotomy for rickets was practised in 1838 by Jobert (de Lamballe), although his operation was not subperiosteal. Most of the subsequent speakers agreed with M. Blot in deprecating the operation at the early age at which it had often been performed. This was the opinion of M. Léon le Fort, who would limit osteotomy to children of ten to twelve years, believing that other means will, at earlier ages, effectually conquer even the most extreme rickety deformities. He expressed the opinion that English and German surgeons have not, in early cases, given sufficiently long trial to other methods of treatment. He showed casts of the legs of two children, one of five and the other of eight years, who had been unable to walk in consequence of extreme curvature, and in whom the deformity was completely removed in fifteen months and two years by simple mechanical appliances. He believed that the chisel rendered the operation less grave, but believed that it was only trivial at the early ages, at which it was really not needed; while at the later ages, at which alone its performance was justified, it was really a much more serious matter than had been asserted. In the subsequent discussion the treatment of rickets and that of the deformities were not carefully distinguished. Mr. Verneuil and M. Marjolin both opposed osteotomy, and the latter quoted some statistics of M. Perrochaud, surgeon to a seaside hospital at Berck, which were held to prove that rickets could be cured by simple residence at the seaside. Curiously enough, the diet on which the children in the hospital were put seems not to have been considered of the least importance. As the cases treated were of the age of two to eight years, it is obvious that they included both the condition of rickets and its consequences; and, as M. Tillaud subsequently pointed out, the deformities caused by rickets often continue to adult life and are

amenable only to operation. He urged French surgeons not to repeat the error they committed in 1866, when they rejected osteotomy altogether.

But the French surgeons, in speaking of osteotomy as an English and German operation, lost sight of the careful study of the treatment of rickety deformities which M. Jules Guérin brought before the profession in 1843, and of which he has recently reminded the Académie de Médecine. His treatment was founded on a careful study of the pathological anatomy of the diseased bones. Osteoclasts, the fracture of the bone, should not, he maintained, be compared with osteotomy, since it is applicable only to a different period, in which the bone is, in the main, composed of soft material; but a shell of bone resists straightening, a shell which may easily be broken. During the "second period" of rickets osteoclasts should, he believed, always be preferred. It is certain, however, that in this period the deformity is still to a great extent amenable to other measures. Osteotomy M. Guérin employed at a later stage, and combined it with division of tendons. He usually had recourse to partial subcutaneous section, dividing the concave side of the bone, while the corresponding portion of the concavity is preserved intact. This is a very important difference between him and his successors, since in his operation the limb does not undergo the shortening which results from the removal of a wedge-shaped piece from the convex side. He strongly insists on the advantage gained by the "subcutaneous" method.

### THE OPEN METHOD OF TREATING STUMPS AFTER AMPUTATION.

WE have been favored by Dr. Frederic S. Dennis, house-surgeon of the Bellevue Hospital, New York, with a reprint of a recent paper by him from the *New York Medical Journal* on the treatment of amputations by the open method. The paper is of great practical value, detailing, as it does, the particulars of ten consecutive cases of amputation, all but one primary, of the thigh, of the leg, of the arm, and at the knee, treated by Dr. James R. Wood, in wards which had been vacated twelve months previously, on account of puerperal fever. The cases were generally bad cases of compound comminuted fracture in patients of very drunken habits. The results were rapid recovery without one death; very mild suppurative fever, in which the temperature never exceeded 103°, but was much more frequently very much lower; in no case was there erysipelas of the stump, or abscess, or sloughing, and the resulting stump was very satisfactory in form and for the purposes of an artificial limb. Dr. Dennis justly claims for Dr. Wood the great credit, not of originating this method of treatment, which, indeed, has been practised by Dr. Humphry of Cambridge, Mr. Wheelhouse of Leeds, and others, but of introducing it and carrying it into practice in the United States.

Dr. Wood attaches the greatest importance to his method of operating, by which he makes two lateral skin-flaps, cutting the muscles circularly at a point so high up that the flaps shall be composed principally of skin. The important point in this method is to make the lateral skin-flaps long, so as to allow for shrinking, and not to separate skin without its subjacent cellular tissue. After a limb

has been amputated the flaps are not even approximated, but left entirely open; a pillow of oakum is placed under the stump, which is allowed to rest on this support until the wound is nearly healed. A small piece of gauze is put over the contour of the stump, and a cradle placed over the limb. This is all the dressing employed. No bandage, no plaster, no charpie is used. The stump is left entirely alone. The wound is left to drain freely, and the stump is gently washed at frequent intervals by means of Esmarch's wound douche, the water being impregnated with crystals of carbolic acid, and after this ablution balsam of Peru is poured over the granulating surface. This method is like Mr. Lister's in being antiseptic in principle, and great care is taken to preserve the cleanness of instruments and hands by washing them after every dressing in carbolic acid. Any one dressing unhealthy wounds in the pavilion or making autopsies is not allowed to assist. As we have said, secondary fever is almost obviated. A careful analysis of cases in the Bellevue Hospital shows the highest temperature reached in suppurative fever, in cases treated openly, to be about equal to the very lowest temperature during fever in any of the cases in which the stumps have been closed. At the end of a week the stump is capable of being moulded into any shape the surgeon may fancy. When suppuration has nearly subsided, the flaps are gradually approximated by adhesive plaster. The profession is much indebted to Dr. Wood and Dr. Dennis for drawing attention to this method of treating stumps and other suppurative wounds, such as that of an amputated breast. It really deserves a very thorough trial.

#### DOUBLE MONSTERS.

THE conclusion arrived at by L. Dittmer, in a long paper on this subject in *Reichert's Archiv*, are as follows:—1. The comprehension of the origin of double abortions is only possible on the basis of Reichert's doctrine of the bilateral and symmetrical structure of the vertebrate organism. These possess no axial structure, but a median plane, primary and secondary commissures. The first indication of the bilateral symmetry is the formation of the primitive groove, which divides the laminar rudiments of the embryo into a right and left half. 2. All double monsters proceed from one egg, with a simple, and originally quite normal, formation-yolk. 3. All double monsters originate from the simple yolk in consequence of an excess of the bilateral symmetrical cleavage of the blastoderm, resulting from a bilateral symmetrical process of fission in the germ. 4. This bilateral and symmetrical process of fission of the germ may proceed from the cephalic or from the caudal extremity, or from both together, and the division of the laminar rudiments takes place under different circumstances, and to a variable depth. 5. In the halves originating from bilateral symmetrical division of the germ, and subsequently undergoing further development, this development proceeds on the basis of a new bilateral symmetrical fission of the germ. 6. This secondary bilateral symmetrical process of germ-fission may, like the primary, become excessive, and lead to bi-symmetrical germ-fission. Three-headed and three-tailed monsters arise in this way. 7. The accessory—that is to say, adjoining—halves of

double embryos frequently occur in a condition of secondary atrophy, in consequence of which an apparent simplicity is produced (rudimentary Janus forms). 8. Double monsters that have a dorsal or ventral tube common to both originate in consequence of the formation of abnormal secondary commissures, the dorsal or visceral laminae or arches of the one embryo uniting with one of those of the opposite. In the commissural lines the normal commissural structures are always present. 9. In no instance do double embryos arise from transverse division of the germ in the line of demarcation between the head and body, nor is this supported on any valid observations. 10. A transverse division of the furrowed embryo does not, in whatever direction it may take place, produce a double embryo, but, just like the fecundation of an ovum with two yolks, two germinal spots, or two germinal vesicles, has the development of twins as its result. 11. Double embryos lying in a straight line also originate from bilateral symmetrical germ-fission, and from development of the accessory halves, elevation of the dorsal laminae, common to both, at the cephalic or caudal extremity, and extension of the area vasculosa in a straight line. 12. Every embryo arranges itself before or after the formation of the primitive groove, with its long axis at right angles to the long axis of the ovum, in consequence of certain but hitherto unknown conditions of space and specific gravity. 13. The same arrangement occurs also from the same causes in double formations, which form a straight line with their long axis.

#### COAGULATION OF THE BLOOD.

At the close of last year, M. Glénard read a paper before the Académie des Sciences (séance Nov. 15, 1875), in which he endeavored to show that carbonic acid gas is without influence on the act of coagulation of the blood, because the blood plasma remained liquid when the vein was plunged into that gas. At a recent séance (28 Février), MM. E. Mathieu and V. Urbain maintained the opposite opinion—first, on the ground that carbonic acid gas passes but slowly through the walls of a vessel, and that either a high temperature or a long period of time would be required to obtain in this way the coagulation of the blood; and, secondly, on the ground of the following experiments:—1. A certain quantity of the blood of a dog, at the moment of its escape from the vessel, is received into the intestine of a fowl suitably prepared. It is shaken for a few minutes in order to permit the escape of the greater part of the carbonic acid gas by exosmose. The blood is then divided into two parts, and placed in separate glasses. Through one a current of hydrogen or other neutral gas is transmitted; through the other a current of carbonic acid gas. It will be then observed that this last coagulates in the course of a few seconds, the temperature being about 100° F., whilst the former remains fluid. An analogous experiment can be made with the plasma. If the blood of the horse, at the moment of issue from the vessel, be received into tubes of glass plunged into ice, no coagulation takes place. The blood-corpuscles slowly fall to the bottom, and transparent colorless plasma may thus be obtained in considerable quantity. On passing for some time a current of air deprived of carbonic acid through

such plasma diluted with four or five times its volume of water and maintained at zero, it is possible to take away the greater part of the carbonic acid gas it contains. The plasma can then be allowed to recover its ordinary temperature without coagulation occurring; but if now carbonic acid gas be transmitted through the liquid, coagulation at once sets in.

#### THE PREVALENCE OF TAPEWORM AND ITS SOURCE.

WE have been favored with a note from M. Decroix, of Lyons, in which he attributes the greater frequency of *tænia mediocanellata* at the present day, as compared with instances of *tænia solium*, to the growing practice of the employment of raw meat as a therapeutic acid, and the fashion of eating uncooked meats. The habitat of the *tænia mediocanellata*, in its larval or cystercus stage, is, as is well known, in the flesh of oxen and sheep; and M. Decroix points out the impossibility, in many cases, of ascertaining its presence in this stage. His chief object is, however, to urge the advisability of horse-flesh being prescribed where it is deemed necessary to give meat in the raw state. He states that not only is the flesh of the horse more nutritious than beef, mutton, or pork, but it has the further advantage of not being infested with any parasite having man for its host. M. Decroix is an ardent advocate in the cause of hippophagy, and as evidence of the increasing popularity of the movement in Paris, he adds that during the first three months of the present year, 2370 horses were slaughtered in that city for food, against 1821 in the corresponding period of 1875. He reminds us further that the sum of 1000 francs will be awarded to the first who opens a "*boucherie chevaline*" in London. Particulars may be obtained from Mr. A. Bicknell, of 23, Onslow-gardens; or of M. Decroix, 86, Cours de Midi, Lyons.

#### COMPARATIVE RESEARCHES ON MILK.

LANGAARD has recently made some comparative researches on human milk, and that of the mare and of the cow. He corroborates the statements made by Biedart in regard to the differences between the milk, and especially between the casein, of the cow and that of humankind. Langaard notices that in koumiss the casein exist in the form of extremely fine flocculi. He finds that mare's milk (*stutenmilch*) is of alkaline reaction when fresh, and retains its alkalinity for two or three days, but then passes into an acid fermentation. It does not then, however, like cow's milk, assume a gelatinous form, but the casein separates in small flocculi. Dilute acids precipitate the casein immediately, but it is readily soluble in an excess. In the case of cow's milk the casein falls in dense masses, which do not readily redissolve in an excess. Alcohol and tannin precipitate the casein of mare's milk completely. If the casein be precipitated by alcohol and deprived of fat by ether, it may be obtained in the form of a fine, loose, slightly yellow powder, that resembles the casein of human milk in its solubility in water, dissolving much more easily than the casein of cow's milk. The watery solution is slightly opalescent, foams on being shaken, and has a neutral reaction. The

dry casein is digested as rapidly as that of the woman. Langaard suggests that it would answer well as a preserved preparation.

#### IMPURE ICE.

WHILE much is being done to secure the purity of our food and drink, there is little doubt that many possible sources of danger yet remain unsuspected. We do not think many people pay sufficient attention to the quality of the ice they consume this weather. An instructive lesson comes to us from the other side of the Atlantic, in the shape of a report detailing a serious outbreak of an intestinal disorder caused by the contamination of drinking-water by means of impure ice. The disease occurred among the frequenters of one of the large hotels which are so plentiful in the States, and was characterised by giddiness, nausea, vomiting, diarrhoea, and severe abdominal pain, accompanied by fever, loss of appetite, continued indigestion, and mental depression. An analysis of the water derived from the ice in use was made, and it was found to be horribly foul; while an examination of the pond from which it had been gathered showed it to be chiefly "a homogeneous mass of marsh mud and decomposing sawdust." With the discontinuance of this particular ice the epidemic ceased. The following warning is conveyed at the end of the report:—"The notion that ice purifies itself by the process of freezing is not based upon trustworthy observation. On the contrary, it is utterly wrong in principle to take ice for consumption from any pond the water of which is so fouled as to be unfit for drinking purposes." We have no hesitation, however, in saying that tons of ice are consumed daily in London which have been obtained from ponds the water of which no one would think of drinking.

#### PECULIAR CASE OF PHLEBITIS.

IN *L'Union Médicale* of July 13th, a young medical student has published his own case, which presents unusual features. On the 26th of January, 1875, he performed at the Charité Hospital of Paris an autopsy upon a man who had died of cirrhosis of the liver. In opening the thorax, he met with a slight scratch on the index-finger of the left hand close to the nail; the epidermis only had been wounded, as no blood could be obtained. In less than five minutes he was seized with violent shivering, which forced him to go to bed, where he tried in vain to recall the warmth of the body. Inflamed lymphatics were soon discovered on the dorsum of the hand, and considerable feverishness supervened. M. Dolbeau advised rest, diaphoresis, and tonics. The axillary glands increased rapidly, and the little wound of the finger began to suppurate. As no improvement took place, the patient went to his native place towards the south of France, and there was attacked with severe pain in the right gluteal region, which soon became localised in the leg of the same side. Here the veins running from the ankle to the knee were transformed into hard cords. The leg now swelled enormously, the patient fell into a typhoid state, and at last obtained some relief by opening a large abscess which had formed about the calf. The illness, however, lasted a long time, with occasional slight improvements, and it was fully six



months after the infliction of the wound ere, after much suffering, he became convalescent.

#### INJECTION OF CHLORAL INTO THE VEINS.

This practice has been decidedly condemned by most of the Paris surgeons; but M. Oré, of Bordeaux, clings to his method, and has proved that the dangers are not so great as have been described. He has lately had the support of M. Linhart, a surgeon in the Austrian navy. It was a case of dislocation of the right shoulder-joint. Reduction without anaesthesia was found impossible, and as the patient had on two previous occasions been narcotised with chloroform, and had suffered severely from the use of this substance, M. Linhart resolved to inject chloral into a vein. This was done in the left arm with great caution, and the solution was injected so that in fourteen minutes about 105 grains of chloral were absorbed. Complete anaesthesia without any reflex movements was thereupon obtained. Reduction quite easy. The patient slept for half an hour, and on being roused had some drink, and fell again to sleep for several hours. No vomiting or any nausea. M. Linhart thinks that the man might have been narcotised with chloroform, but that he would have required a good deal of it, and that the effect which, with the chloral, lasted almost two days, would, with chloroform, have been more transient. It may be doubted whether these are sufficient reasons for running the risks of intra-venous injection.

#### ADVICE TO BATHERS.

We are glad to observe that the Royal Humane Society has issued some excellent instructions for the guidance of bathers. Fatal accidents in the water have been unusually numerous this year, especially since the advent of the very hot weather, and the appearance of the notice of the Humane Society is most opportune. It cannot be too widely circulated:—

"Avoid bathing within two hours after a meal, or when exhausted by fatigue or from any other cause, or when the body is cooling after perspiration; and avoid bathing altogether in the open air if, after having been a short time in the water, there is a sense of chilliness, with numbness of the hands and feet; but bathe when the body is warm, provided no time is lost in getting into the water. Avoid chilling the body by sitting or standing undressed on the banks or in boats after having been in the water, or remaining too long in the water. Leave the water immediately there is the slightest feeling of chilliness. The vigorous and strong may bathe early in the morning on an empty stomach, but the young and those who are weak had better bathe two or three hours after a meal; the best time for such is from two to three hours after breakfast. Those who are subject to attacks of giddiness or faintness, and those who suffer from palpitation and other sense of discomfort at the heart, should not bathe without first consulting their medical adviser."

#### TRANSFUSION WITH MILK.

DR. GAILLARD THOMAS, of New York, has re-

cently used milk for transfusion with complete success. He had removed both ovaries in a subject in which the organs were affected by solid tumours. The patient, at the time of the operation, was in a weak and emaciated condition. She went on well for the first thirty-six hours after the operation, but on the third day a profuse uterine hæmorrhage took place. After a few hours, bleeding recurred, and a tampon was inserted in the vagina. The stomach and rectum now rejected all food, in however small quantities. On the evening of the fourth day the patient appeared to be rapidly sinking, with a temperature of 101° Fahr., a pulse of 150, and a facial expression of approaching dissolution. Transfusion with milk was now decided upon and done. Eight and a half ounces of warm milk, fresh from the cow, was injected into the median basilic vein. When three ounces had been injected, the pulse could scarcely be felt, the patient said she felt as if her head would burst, and seemed greatly overcome. In an hour after the operation she had a rigor, the pulse rose to 160 a minute, and the temperature to 104°. The temperature towards midnight became lower, and the patient fell into a sound sleep, which lasted until morning. She from that time continued to improve, and on the twenty-first day was completely recovered.

#### ANATOMY OF THE EAR.

POLITZER (*Archiv f. Ohrenheilk*, B. ix., p. 158) gives the results of the examinations of the stapedius muscle and of the styloid process. In newly-born children the stapedius muscle and facial nerve are in contact below, and even in adults the osseous wall between the two is seldom complete. In longitudinal sections the stapedius muscle is pyriform, in transverse sections prismatic, with rounded borders. Its action is that of a relaxor of the membrana tympani, and it is therefore an antagonist of the tensor tympani. As regards the styloid process, Politzer finds that it results from the ossification of a cartilaginous rod originally isolable; the upper end of this may be traced beyond its apparent basis along the posterior wall of the tympanic cavity, from which it is separated by a thin bony lamella as far as to the eminentia stapedii. In new-born children the styloid process presents a club-like enlargement at its upper part, and terminates below in one or several cone-like rods. In adults it usually coalesces with the adjoining bones above by continuous ossification, but sometimes remains separate or is segmented. It generally forms cancellous texture with or without a central canal.

#### CILIATED PUS-CELLS.

In a communication made to the *Centralblatt* (10th June) Prof. E. Neumann, of Königsberg, states that if a catarrhal condition of the mouth and throat of a frog be established by the application of a few drops of a weak solution of osmic acid (one quarter to one-half per cent.), the secretion of the mouth will be found to contain, in the course of from twenty-four to forty-eight hours, besides numerous slightly browned but otherwise unaltered epithelial ciliated cells, cup cells, and, besides amoeboid cells presenting the usual characters of pus-cells, peculiar cells of an intermediate

kind, which resemble the former in having cilia, and the latter in their contractility. The cilia do not cover the whole surface, but form a kind of crown, or are compressed into a brush. They are imbedded directly in the protoplasm without the intervention of any basal seam. The cells often rotate actively in consequence of the play of the cilia, and then preserve an approximatively round form; but as soon as the cilia cease to play they begin to perform amoeboid movements.

#### TRICHINOSIS IN AMERICA.

THE Transactions of the Indiana State Medical Society for the past year contain a report on Trichinosis by Dr. Geo. Sutton. It appears that over five millions of hogs are slaughtered and packed annually in the Western States, not including those which are put up for family use by the farmers. Quite 4 per cent. of this is estimated to be diseased. From the cases of trichinosis which came under Dr. Sutton's observation, together with the results of post-mortem examinations, he comes to the conclusion that 90 per cent. of disease produced by eating trichinous pork appears either as gastro-enteritis or as diarrhoea or dysentery, and not more than 10 per cent. as the fully-developed form of trichinosis, in which the muscular system becomes affected. He thinks that trichinae have a much larger influence in the etiology of enteritis, dysentery, &c., than is suspected by the profession. As in Germany, it was found that protracted salting of the meat did not kill the parasites; nothing but thorough cooking at a high heat will destroy them.

#### CONCENTRATED SOLUTION OF SALICYLIC ACID.

A CONCENTRATED solution of salicylic acid (which is only sparingly soluble in cold water) must be often desired by the medical practitioner. After many experiments, a pharmacist adopted the following form of preparation, which is given in the last number of the *Pharmaceutical Journal*:

R. Acid. salicylic pur., 3 ij.  
Sodii biborat., 3 j.  
Glycerinae, q. s.

Mix the acid and borax with f. 3 iv. glycerine, heat gently until dissolved, and then add enough glycerine to make the whole measure one fluid ounce. This solution contains 25 per cent. of salicylic acid, and can be diluted with either glycerine, alcohol, or water to any degree required.

#### CONTAGIOUS DISEASES ACTS FOR AMERICA.

THE Grand Jury of the City and County of New York on the closing of the May Sessions handed into the presiding judge a presentment signed by the foreman, which states, very temperately, the evils that ensue from uncontrolled prostitution. The grand jury points out that, though it is impossible for legislation to suppress prostitution completely, it is comparatively easy to regulate and circumscribe this evil—a fact which has been abundantly proved in this country by the success of the Contagious Diseases Acts,—and ends the presentment with a resolution that the Legislature be urged to adopt laws calculated to bring

houses of ill-fame under the control of the Boards of Health and Police.

#### EQUINE RHEUMATIC ENDOCARDITIS.

THE coincidence of acute rheumatism and endocarditis has rarely been observed in the lower animals. M. Trasbot, Professor at the Veterinary School at Alfort, has lately exhibited morbid specimens from a filly, aged seventeen years, which showed chronic endocarditis with vegetations on and incompetence of the mitral valve, and also of the pulmonary valves, and great dilatation, vegetation upon, and incompetence of the tricuspid valves. Previous to the appearance of the cardiac troubles the animal had suffered from an arthritis, which was regarded as rheumatic in character.

THE *Chicago Medical Journal and Examiner* for June contains a report by an army surgeon of transfusion of defibrinated human blood in a case of tubercular phthisis. The patient was reduced to the last stage of emaciation and exhaustion and was not expected to live forty-eight hours. Nearly four ounces of blood were injected, when, the patient complaining of a sense of fullness in the head, the operation was stopped. Just before the operation his temperature was a little over 102° F., pulse 105, and respiration 34, and he was in great distress. Very soon after the operation his respiration fell to 27, with a lowered temperature and pulse, and he breathed comfortably. The night-sweats, which had been very severe, ceased on the third night after the transfusion, and the hæmoptysis, which had been frequent, disappeared. "He began at once to gain appetite, strength, and flesh. In less than a month he gained seventeen pounds in weight, and is increasing in weight at the rate of three-quarters of a pound daily. The dyspnoea is now insignificant and the destruction of lung-tissue seems to have been arrested."

#### OBSERVATIONS ON THE CIRCULATION MADE ON MR. WESTON DURING HIS LATE 500-MILE WALK.

By F. A. MAHOMED, M.D.,

Pathologist to St. Mary's Hospital.

DURING the last week Mr. Weston allowed me to make a series of observations on his circulation, while engaged in his 500-mile walk, and it is at his request that I now send them for publication.

On several occasions I attempted to obtain simultaneous cardiographic and stethographic tracings, but without success, the heart's impulse being but indistinctly felt, and not having sufficient force to afford a tracing. In the accompanying plate, the sphygmographic tracings obtained are reproduced, together with a nightly record of the distance walked, weight, temperature, and frequency of pulse and respiratory movements.

I have elsewhere shown that exercise appears to produce two important and opposite effects on the circulation, according to the general condition of the person under observation. In persons out of

condition and unaccustomed to it, exercise reduces the arterial tension and increases the temperature; carried to an extreme this condition may produce syncope from anæmia of the brain, which is robbed of its blood by the unduly increased requirements of the muscles, and sudden failure, by paralysis, of the action of the heart. On the other hand, it may increase the arterial tension. The cause for this increase is more obscure: it would appear to occur from impaired nutritive power in the tissues interfering with what has been called the chemico-vital capillary power, and thus causing capillary obstruction; or some might explain it, though I do not think so correctly, by contraction of the arterioles due to irritation of their vasomotor nerves by an irritable and exhausted brain. Or, again, it may be produced from the action of the heart being excited to a degree above that required for the effectual circulation of the blood, the influx of blood into the vessels being in excess of the afflux by the capillaries, thus raising the arterial tension. This condition of increased arterial tension appears to have been present to a slight degree in the case of Mr. Weston, and more powerfully in one of his competitors, Taylor.

Variation of tension in this direction is accompanied by a reduction of the temperature. It increases the work required from the heart, and failure of that organ to meet the strain thrown upon it gives rise to dilatation. This is indicated by a number of symptoms which may be easily recognised; the chief ones being breathlessness, oppression at the præcordia, vertigo, coldness of the extremities, and reduction of temperature of the body generally; pallor and anxiety of the face, dilatation of the pupil, smallness and irregularity of the pulse, with a constantly full vessel, with irregularity and shallowness of the respiratory acts—a condition to which Taylor was reduced, and which is indicated by his pulse tracing (No. 10).

It will be seen from the tracings that Mr. Weston began with a perfectly normal pulse (No. 1), and that during the first two days the tension was somewhat reduced (Nos. 2 and 3). During the next three days the tension gradually rose, and attained its highest point on the fifth day of his walk (Nos. 4, 5, 6, and 7). The increased tension of the latter day is demonstrated by the prolongation of the tidal wave, and the height of the aortic notch from the base line of the tracing (Nos. 6 and 7). His temperature was reduced simultaneously with the increase of arterial pressure. On the sixth day he did but little work in the morning, and had a good mid-day sleep, which greatly refreshed him, and improved his general condition. Previous to this he suffered extremely from want of sleep. In the evening of the sixth his temperature was again raised, and his arterial tension reduced (No. 8). The next tracing (No. 9), was obtained on Monday, the 18th inst., after thirty-six hours' rest and good living. It shows a normal condition of the arterial tension with relaxed vessels, and represents a large soft pulse.

Mr. Weston presents no indications of arterial diseases or hypertrophy of the heart. The heart-sounds were perfectly normal, except on the occasion of the increase of tension, when the second sound was accentuated and the first prolonged.

By the light of these observations we may conclude that on those occasions, during his previous walks, when his temperature was reduced below normal, the arterial tension was coincidently increased.

## News Items, Medical Facts, &c.

**METHOD OF PREVENTING THE DISCHARGES FROM PASSING BETWEEN THE SKIN AND DRESSINGS.**—Dr. C. Pennington, House-surgeon, Bellevue Hospital, New York, has successfully practised the following method for obviating a common cause of annoyance arising from the passage of the purulent discharge between the skin and dressing in cases where a compound fracture has been placed in a plaster-of-Paris bandage or other immovable dressing, and the requisite fenestra made. The method simply consists in causing a piece of oil-silk to adhere to the skin beneath the wound, and, by its aid, conducting the discharge into any vessel placed to receive it. The oil-silk is secured by first brushing over the skin the ordinary collodion, and then applying the oil-silk, and finishing by applying another coat of collodion on the surface of the oil-silk.

**RECTAL EXPLORATION.**—It is well known that Prof. Simon, of Heidelberg, published in 1879 an essay on the Artificial Dilatation of the Anus and the Rectum, with a view to exploration or operation. The practice of introducing the whole hand into the rectum, and carrying it as high as the aortic bifurcation, has, on Simon's authority, been applied by many surgeons, and it would seem without unpleasant consequences. Still a certain amount of caution is necessary, as it has been proved in a paper by Dr. Dandridge, published in the *Cincinnati Lancet and Observer*, May, 1876, that in several cases the result has been fatal through the rupture of intestine or peritonitis. The cases are regarded as so important that Dr. Dandridge's paper has been translated *in extenso*, and published in the *Bulletin de Therapeutique* of Paris, June 15th, 1876.

**A CASE OF LITHOPÆDION.**—At a meeting of the Medical Society of Vienna of June 16th, 1876, Dr. Chiari showed a tumour taken from a woman, eighty-two years of age, who had lately died in the hospital of an attack of pneumonia. By the side of the uterus, which was very long, a swelling the size of a man's head was found, and on opening it most of the parts of a foetus were discovered. The woman stated that in 1827 she was for the last time in the family way. After the eighth month she felt no approaching confinement, and went on, without experiencing any pain, with a large tumour in the abdomen. She never consulted anyone about it, and lived on for fifty years with the unsightly swelling. Dr. Chiari, after a minute examination of the pelvic cavity, concluded that this was a case of abdominal pregnancy.

**TREATMENT OF SEVERE DYSENTERY.**—Drs. Maury, Gaillard Thomas, and Dille, considering that in very intractable cases of dysentery the large intestine and the rectum are in a state of great irritation, the latter being the cause of the rectal tenesmus, have (says the *New York Medical Journal*) put the patient to sleep, and when quite narcotised introduced a speculum, by means of which the intestine was fully dilated. The mucous membrane was then superficially cauterised with nitrate of silver, carrying the latter as high as possible. During the following days carbolio acid, one to eight, was thrown up the bowel. Great improvement followed the cauterisation, tenesmus disappeared, the evacuations diminished in number, the appetite returned, and in five or six days the cure was perfect.

**KAVA-KAVA IN GONORRHOEA.**—The *New York Medical Record* (May 20th, 1876) mentions this root as being extensively used against gonorrhoea in the islands of the Pacific. It is the *Piper methysalicum*. From sixty to ninety grains of the root, cut into small pieces, should be macerated for five minutes in a pint of water, and frequently shaken. Filter, and give half before eating and half after meals every day until recovery. Twenty minutes after the first dose there is a strong desire to pass urine; the latter is abundant, and looks like water. Ardor urinae disappears, and the patient feels relieved. The treatment lasts from ten to twelve days. The kava acts, besides, as a bitter tonic, and is of an agreeable taste, excites the appetite, and gives rise to neither diarrhoea nor constipation.

**GELSEMINUM SEMPERVIRENS IN NEURALGIA.**—Dr. Jurasz, of Heidelberg, has used the tincture in five cases of neuralgia. In the first case, five drops three times a day (facial neuralgia); cured in three days. Second case of the same kind as the first, four drops three times a day; cured in six days. Third case, supra-orbital neuralgia, ten drops three times a day; cured in four days. Fourth case, neuralgia of the fifth pair on both sides, five drops every day; cured in two days. Fifth case, severe sciatica, eight drops three times a day; almost cured in fifteen days, and complete cure was then obtained by the continuous current and warm baths. The gelseminum failed to relieve a hemicrania of old standing, and was also unsuccessful in two cases of muscular rheumatism.

**INJECTION OF ATROPINE IN TRISMUS.**—At a late meeting of the American Neurological Association, Dr. Shaw described a case of hysterical trismus that yielded very readily to the use of hypodermic injections of atropine. The patient was a German girl, who had a penetrating wound of the foot, caused by a nail. Trismus supervened, and, although the integument was removed in the neighborhood of the cicatrix, no relief was obtained. The patient was given hypodermic injections of atropine, and within twenty-four hours was relieved. Periodically fresh attacks would occur; but in every case there was a relief of the symptoms after the use of the drug. It was found necessary to administer the remedy in sufficiently full doses to produce delirium.

**SUNSTROKE AND ALCOHOL.**—The necessity of temperance in drink on the part of those whose avocations lead them to be exposed to the sun this weather cannot be too forcibly urged. Over and over again in India the immunity from sunstroke enjoyed by temperate men has been observed. It may be interesting now to recount Sir Charles Napier's description of his personal seizure while serving in India (as reported in Sir Ronald Martin's excellent work, "The Diseases of Tropical Countries"): "I had hardly," writes Sir Charles, "written the above sentence when I was tumbled over with heat apoplexy; forty-three others were struck, all Europeans, and all died within three hours, except myself. I do not drink. That is the secret. The sun had no ally in liquor in my brain."

**RUPTURE OF SYMPHYSIS PUBIS DURING LABOUR.**—A case of Rupture of the Symphysis Pubis during Labour is reported in the last number of the *Boston Medical and Surgical Journal*. The facts are briefly as follows:—Patient a primipara, well formed, forty-two years old. Liquor amnii escaped twenty-four hours before labour began. Head for about eight hours fixed in the brim of the pelvis. Os rigid, undilated. Presentation vertex, second position. Bladder emptied, and forceps applied. During strong expulsive pains, traction was made with the instrument in direction of the axis of the brim, when the symphysis pubis gave way with a loud crack. The labour was then rapidly completed. By the latest account the woman and child were doing well.

**CURE OF A SUPPOSED CASE OF HYDROPHOBIA WITH STRYCHNIA AND WOORARA.**—In the last number of the *American Journal of the Medical Sciences*, Dr. B. A. Watson describes a supposed case of rabies canina cured with strychnia and woorara, the latter used hypodermically. It does not appear certain that the disease was true rabies, although another person bitten by the same dog died with unmistakable symptoms of the malady.

**CHLORAL PLASTER.**—For neuralgia, rheumatic pains, &c., use the ordinary emplastrum roboraans, and powder it with the chloral. Apply the plaster to the affected part and leave it from twenty-four to forty-eight hours. When taken off, the skin is found studded with vesicles; these are to be pricked with a pin, followed by a dressing with simple ointment. The pain vanishes long before the vesicles are dried up.

PRINTED AND PUBLISHED BY

WM. C. HERALD, Nos. 52 & 54 JOHN ST., NEW YORK.

# THE LANCET.

A Journal of British and Foreign Medicine, Physiology, Surgery,  
Chemistry, Criticism, Literature, and News.

JAMES G. WAKLEY, M.D., M.R.C.S., EDITOR.

PUBLISHED MONTHLY.

No. 11.

NEW YORK, NOVEMBER, 1876.

## Clinical Lecture

ON

### CERTAIN RARE FORMS OF SOLID ŒDEMA OF THE LEGS.

*Delivered at the London Hospital,*

By JONATHAN HUTCHINSON, F.R.C.S.,

Senior Surgeon to the Hospital.

GENTLEMEN,—In connexion with several cases which have recently been under our observation, I wish to-day to ask your attention to the different causes of œdema of the legs. Under many circumstances œdema of these parts is connected with a tendency to effusion into the cellular tissue generally, with implication, perhaps, of the great serous cavities also. In most of these it is indicative either of a central impediment to the circulation in the form of heart disease, or of deficient action on the part of the kidneys. There are many other cases, however, in which the swelling of the legs is due to a cause more or less distinctly local, and there are others in which local and general causes each take their share in the result. It becomes of importance, then, and of much interest, to discriminate in each individual case as to the special cause which is at work; and before introducing to you the individual cases, I will attempt an enumeration of the principal groups into which we may classify them.

First let us note the obvious fact that in the lower extremities the venous circulation is at some difficulty, and that if any influence be at work in the body tending to produce transudation of serum from the bloodvessels it will probably show itself first in the feet and legs. Thus it may be convenient to mention, as the first group, cases in which slight passive dropsy occurs in connexion with mere debility. This is common enough, and especially so in the aged and in those whose occupations compel them to remain for long periods standing. Although often unattended by any discoverable disease either in heart or kidneys, its oc-

currence of course always suggests an examination of those organs.

In the second group we may place cases in which the œdema is due to positive impediment in the heart. In these it will almost always be confined at first to the feet and legs, and it will be purely passive—that is, unattended by any inflammatory induration of the parts affected.

In the third group œdema from disease of the kidneys may be placed; and of these cases we may remark that not unfrequently from the first there is swelling of other parts—the eyelids, backs of hands, &c.,—and very frequently dropsy of the serous cavities.

Of the three forms of œdema just mentioned, it may be said that they are almost always symmetrical and of nearly equal severity in the two limbs. Those which are to follow, however, do not observe this rule, and although any one of them may affect both legs, it is far more common in most of them to observe the symptom on one side only. This onesidedness, of course, attracts our attention to a local cause.

In the fourth group we may include all cases in which the œdema is due to mechanical obstacle to the return of venous blood. The commonest example of this class is in the instance of pregnant women in whom the weight of the uterus, pressing upon the iliac veins of one or both sides, very frequently causes what we may suitably call venous œdema of one or both legs. Ovarian tumours, or any other kind of tumour in the abdomen, may produce similar results. And let me here remark that it is by no means certain that the swelling in these cases will wholly disappear when the cause is removed; for not very unfrequently we observe cases in which repeated pregnancies have at length induced a condition of permanent dilatation of the veins with swelling of the feet. The risk of the œdema becoming permanent is, however, far less than in certain cases which I shall have to mention presently in which local inflammation occupies the chief place as a cause.

In the fifth group we will place all cases in which there is actual disease of the venous trunks. In cases of phlebitis of the main vein of the limb you have seen the extremity become suddenly much swollen and œdematous, and in such cases the œdema will always be, both as regards its ex-

tent and its permanence, in relation with its cause. In plugging of superficial veins, we rarely observe any great amount of œdema, and the same remark is true of the numerous cases in which the superficial veins become entirely disabled by varicose dilatation. In these cases the deeper trunks are efficient to carry on the circulation. In connexion with this group I must mention the disease known as *phlegmasia dolens*, which has by many been associated, and perhaps correctly in some cases, with venous occlusion. I find it difficult, however, to believe that plugging of veins is the usual cause of this affection; for, if it were, the deep veins would often be obliterated, and the result would be compensatory enlargement of the superficial ones. The phenomena of *phlegmasia dolens* are far more like those of lymphatic than venous obstruction, and it ought probably to be included in our next group.

The sixth group shall include those cases in which the œdema is wholly or chiefly due to lymphatic obstruction. So little has as yet been made out as to the pathology of the lymphatic system, and so few are our opportunities of post-mortem examination in this direction, that we are obliged to be somewhat less certain in our statements regarding this group than in any other. I do not think, however, that I shall run any risk of misleading you if I ask you to believe that the lymphatic system often takes a large and chief share in the production of œdema, and that it is quite possible for long tracts of the lymphatic tubes to be occluded by inflammatory thickening. I shall have to mention presently one very instructive case in which a whole network of lymphatic trunks in an indurated and cord-like condition could be very easily felt under the skin. In the majority of cases, however, the diagnosis of lymphatic obstruction is conjectural only, and depends to a considerable extent upon the absence of any other satisfactory explanation of the symptoms. In lymphatic cases the disease is almost always non-symmetrical. We may note also, as a curious fact, that very commonly no enlargement of the lymphatic *glands* occurs. I should be inclined to suspect this cause in any case in which the œdema was strictly local and abruptly limited, there being no evidence of disease of the veins or of mechanical pressure. I should consider my diagnosis confirmed if the œdema cleared off without leaving any dilatation of superficial veins, and during the progress of the case I should repeatedly and carefully examine the limb in order to ascertain if any little lines like whip-cord could be felt under it. It is very difficult in many cases to separate solid œdema consequent on obstructed lymphatics from chronic inflammation of the cellular tissue, and in point of fact it is exceedingly probable that the two conditions usually complicate each other. Indeed, it is not unlikely that primary disease of the lymphatics is extremely rare, and that almost always it is secondary to inflammation of the skin and subcutaneous tissues. Modern research has shown that the lymphatic radicles terminate in the areolar interspaces. Hence the facility with which the lymphatic system becomes involved in all forms of inflammation of the skin allied to the erysipelatous.

My last group—the seventh—shall comprise all cases in which the œdema is the result of local inflammation; and these arrange themselves under three heads—those in which the inflammation is

allied to erysipelas, those in which it takes the form of elephantiasis, and those in which thrombosis of venous capillaries, or true purpuric ecchymosis, occurs. The last of these is one of but little importance, and I shall not again advert to it; but the other two are of much interest, and it is with them that I shall be chiefly concerned in the rest of my lecture.

The term “elephantiasis” is now definitely understood to be restricted to those cases of which the common Barbadoes leg is an exaggerated type. It is the *Elephantiasis Arabum*, the *Boucniemia* of Mr. Erasmus Wilson, and the *Scleriosis* of some continental writers. It has nothing whatever to do with true leprosy, to which unfortunately the term *Elephantiasis Græcorum* was formerly applied. Now in all cases to which the term elephantiasis is applicable there is œdema and something more; there is also overgrowth. And here we establish the line of demarcation between elephantiasis and all other varieties of persistent œdema. Prove that the tissues have become hypertrophied, that they are not only sodden with serum, but that they are overgrown, and you prove the right of the malady to the title of elephantoid. It has hitherto been the custom to use this name only in application to the most exaggerated examples of the disease. Nothing can be more injurious to our correct appreciation of the processes of disease than this unfortunate habit. Size ought never to be made a basis for classification; and between the conditions of chronic thickening of skin, with solid œdema and papillary growth, which are not at all uncommon in our out-patient rooms, and the most hideous example of Barbadoes leg which you could find in the West Indian Islands, there is no distinction excepting that of degree; the pathological process is precisely the same in both. The same remark applies to the cases of inflammatory hypertrophy of the labia, which are not uncommon in English practice. In hot countries two forms of elephantiasis are recognised, but they are not wholly distinct, and I believe that not unfrequently one precedes the other. I allude to the tuberculated and the smooth varieties. In the smooth there is much less evidence of growth than there is in the tuberculated, or rather perhaps we ought to say there is less evidence of papillary growth. In the one the skin becomes warty and nodular; in the other, although much indurated, it remains smooth. The tuberculated form rarely affects both legs, whilst the smooth frequently does so. I am told that in India it is usual to consider the smooth form as associated with constitutional disease, and as indicating the necessity for change of residence and the use of quinine; whilst the tuberculated is more purely local. In English practice we meet also with the two varieties. In most cases the tuberculated form of elephantiasis takes its origin from some local injury or local source of inflammation: an ulcer on the leg; an attack of eczema; or, on the genitals, venereal sores may be its starting-point. The smooth form, however, begins usually without such cause, and is often set up by a form of inflammation somewhat resembling erysipelas. To this stage the name *Barbadoes rose* has been given. It differs from the common forms of erysipelas in having no abrupt margin and in being unattended by vesications, and, further, in the fact that the fluid effused shows no tendency to reabsorption. The attack is, however, distinctly

inflammatory, and it is very probable that inflammation of the lymphatics takes a considerable share in its results. We have in both forms of elephantiasis a very interesting illustration of the results of overfeeding of tissues. Inflammatory disturbance of nutrition is the starting-point. The tissues are flooded with serum, and, owing to their dependent position (scrotum, labium, or leg), this serum has difficulty as to its reabsorption. The cells of the part, already in a state of excitement, feed on it, and irregular modes of growth are the result. You might obtain a somewhat parallel phenomenon, if to any given village unlimited supplies of meat and beer were weekly consigned for gratuitous distribution.

I think I have now said enough to place you in a position to appreciate the cases which I have to relate. I shall not trouble you with any examples of the more common forms of dropsy—these being, indeed, of medical rather than of surgical interest,—but shall restrict myself to those of the more unusual forms, preferring such as afford some clue to the nature of the malady.

In the following case we have an instance of immense solid oedema of the whole lower extremity up to the very hip, occurring in a syphilitic patient, as a sequel to a slight bruise of the foot.

On June 28th, 1871, I saw with Mr. Cornelius Garman, of Bow, a very curious case of unsymmetrical persistent oedema. Our patient was a thin, nervous woman, aged about forty-two, the wife of a sea captain. Her left leg, from the pelvis downwards, was enormously swollen, the skin being smooth and brawny. About the foot there were patches of congestion, but in the thigh, where the swelling was as conspicuous as in the leg, the skin was quite pale. The thigh measured five inches more in girth than its fellow, and she assured me that a year ago it had been for a time very much larger than at present. The toes and lowest part of the foot were not swollen in proportion with the rest of the member, the oedema beginning about the instep, and increasing up the left thigh. There was not a trace of oedema in the other leg. Mrs. B—— told us that it had followed from a slight bruise on the instep from a fender. She pointed out to us the exact place of the bruise, and said that inflammation and swelling of the foot followed almost directly after it, although there was no abrasion, and had never been any wound. It was now eighteen months since this slight accident, and although the leg had at times improved it had never returned to its former size. Mrs. B—— complained much of severe aching pain in various parts of the limb; she had never observed any lines of inflamed lymphatics, nor had the inguinal glands ever enlarged. She had repeatedly been obliged to remain in bed for a few days at a time when the swelling was greater than usual, but she would not admit that she had ever derived more than very temporary benefit from the recumbent posture, and asserted that on the whole the limb was better when she walked about. I was told by Mr. Garman that he believed she was accustomed to drink spirits, and that seven years ago he had attended her for constitutional syphilis, some scars of which (rupia) he showed me. Of late years she had not had any symptoms referable to syphilis, and had, indeed, enjoyed good health.

In December, 1872, Mr. Garman was kind

enough, in answer to an inquiry, to inform me of the progress of the case. We had determined on a course of iodide of potassium internally, and the local use of an evaporating lead lotion, insisting also on as much rest in bed as possible. The iodide had made her sick, and had been replaced by small doses of mercury, and under these the leg so much improved that it returned to almost its natural size. After remaining well for some months, a relapse occurred, and great swelling was again produced. The patient, at the date of Mr. Garman's letter, was on a voyage to Australia.

In 1872 Mrs. B—— was again brought to me by Mr. Garman, this time on account of a deep syphilitic ulcer on her left arm. Of this she soon got well under the use of iodide and mercurials. Her leg still remained larger than the other, and liable to temporary increase of oedema.

The next case which I shall relate to you is in many respects similar to the preceding one, but it has some features of yet greater interest. We have the same history of constitutional syphilis in the background, and of a slight bruise on the leg as an exciting cause. Then follows a long attack of oedema of one lower extremity, with, ultimately, sudden implication of its fellow. Enlarged and tortuous trunks of lymphatics were easily recognised in the abdominal wall.

Mr. W——, a gentleman of about fifty, was formerly under my care for several years on account of syphilis affecting his nervous system, and took iodide of potassium almost continuously for a very long period. In the beginning of June, 1871, he came to me one day complaining of pain in his right leg. I could find nothing the matter with it, but three days later the whole leg was in a condition of soft oedema, and on the outer part there was the ecchymosis of a bruise. The skin was not in the least cut; it was a simple contusion. On the first occasion he had denied having had any injury, but he now recollected that he had struck his shin in getting into a railway carriage. The oedema was peculiar in its sameness in all parts of the leg, and in the fact that the skin was pale, and had not the slightest trace of congestion. The leg measured an inch and a half more in girth than the other, and wherever pressure was made a deep pit was produced. A few days later he complained of pain up the inner side of the thigh, and we could distinctly trace an enlarged lymphatic cord. A few days after this the whole thigh was swollen, measuring an inch more than the other. He had in connexion with this oedema of the leg no special constitutional symptoms. At the end of a fortnight the oedema of the leg had almost wholly disappeared, and that of the thigh had diminished. After this, however, the oedema returned, and I advised that he should have the advantage of sea-air. He went to Ramsgate, and was there under the care of Mr. Henry Curling. One day I was hastily summoned there to see him, as he was in great alarm on account of sudden swelling of the other leg and thigh. For some weeks at this stage both lower extremities were greatly swollen, and he was wholly confined to bed.

On Sept. 10th Mr. W—— returned from Ramsgate. Whilst there he had much improved in health. During the last fortnight of his stay he had omitted the iodide of potassium, and without any relapse of his nerve symptoms. He had been three months there, and during the greater part of



the time had been able to get out in a Bath-chair, but not to walk. At one time, about a month before his return, the swelling had wholly disappeared from his right leg, and after he had been a fortnight free from it, it again suddenly returned. On one occasion some large patches of erythema appeared on the left leg; he had also had great irritation in the skin of the legs. His condition at the time of his return was as follows:—Both lower extremities very greatly swollen, below the knee distinctly cedematous, so as to pit deeply, but above the knee hard and brawny; some congestion of patches on the left side, and a number of spots, probably the result of scratching. The swelling ended at his hips, and the upper part of his trunk was quite free from it. On the lower half of his abdomen, in the subcutaneous tissue, several hard cords could be felt. These could be traced in some places for six or eight inches in length; they appeared to be as large as crow-quills. The question was, were these lymphatics or veins? No discoloration over them could be detected, but he told me that some weeks ago the skin had been red. Their great hardness, and the knotted unevenness of their surface, seemed to me almost conclusive as to their being lymphatics, and against the conjectured existence of phlebitis. I must note that none of the superficial veins, either of the thighs or abdomen, were visible, nor could I detect anything peculiar along the course of the veins in Scarpa's triangle. We must, however, make some allowance, in respect to the latter point, for the brawny condition of his thighs, which prevented more accurate examination. I cannot believe that phlebotic thrombosis could cause such persistent oedema of the legs without being attended by enlargement of the collateral channels, and of this there was not the slightest trace.

As Mr. W— was naturally anxious at the protracted duration of his symptoms, I suggested a consultation with Mr. Hilton. We met on Sept. 14th. Mr. Hilton agreed with me that the enlarged trunks felt in the abdominal wall were lymphatics, and not veins. After this Mr. W—'s symptoms continued to improve. In the course of a fortnight he could walk about, though the limbs were still somewhat swollen. During October some cord-like lymphatic trunks again appeared on the inner side of his right thigh, where they had been noticed in the first instance; but they had subsided in a week or two. In the beginning of November, 1871, the lower extremities had almost returned to their former size, and he was going about moderately. He was still unable to put his boots on, and wore loose cloth ones. The network of lymphatic trunks which had been for so long present over his left hip could only be felt here and there. A brawny condition of the backs of his thighs and soft oedema of the ankles, &c., had been his last symptoms.

As regards treatment, we had been giving him a rather active saline diuretic throughout. It had agreed well with his stomach, but had not produced any material diuresis. It is very possible that it had no share in the cure; but I may note that, when, after our consultation, we substituted it for a few days by the chlorate of potash, the legs swelled more. Mr. W— throughout spent his time on a couch, with the feet elevated so as to be much higher than his trunk. We had his bed lifted in a similar manner. Whilst the legs were at their worst he got no benefit from bandaging; it

was tried on several occasions, and each time laid aside, as it irritated the skin and produced local swellings. When, however, oedema of the ankles and feet was the only remaining symptom, we used bandaging at night with benefit, disusing it in the daytime.

November, 1872.—Mr. W— is in good health, and able to take exercise freely. I cannot, however, assert that he is wholly free from oedema about his ankles. I have never seen him without some slight evidence of pitting, and if he falls out of health it increases. He still takes tonics frequently, and has had every advantage which change of air and long residence at the seaside could give. The fact that his oedema still persists may, I think, be instructively kept in mind when we have to investigate some of our other cases in which implication of the lymphatics was not proved. In Mr. W—'s case there can, I think, be no reasonable doubt that lymphatic obstruction was the chief cause of his symptoms.

August, 1876.—The above report as to Mr. W—'s health and the local condition will still apply. He is obliged to wear elastic stockings, but is otherwise well.

In January, 1872, I saw, at the request of Mr. Disney Thorp, of Malden, and in consultation with my friend Mr. Abernethy Kingdon, a gentleman whose case in some features resembled that of Mr. W—. Our patient was sixty years old, tall, and rather stout. He had been accustomed to take a great deal of exercise, and had several times had his legs bruised. Eighteen months before I saw him he had suffered from what was considered to have been phlebitis of the deep veins of the left leg, which caused oedema, which persisted for a long time. At length it passed off almost completely, and after an interval his right leg began to suffer in a similar way. When I saw him his right leg was considerably swollen, and his left scarcely at all; and I could not but be struck with the resemblance of his history to that of my patient Mr. W—. Had it really been phlebitis? I could find no corroboration for this suspicion, for the superficial veins were not in the least enlarged. I must admit, however, that I was equally unsuccessful in proving any implication of the lymphatics. After his return home our patient made a perfect recovery. In November, 1872, Mr. Thorpe wrote to me that he was quite well, and able to hunt and shoot as usual.

I show you a photograph representing the state of legs in a man who was under care for a short time in this hospital about a year ago. You will see that the oedema is wholly confined to one leg, which is increased to at least twice the size of the other. The skin was somewhat thickened and hypertrophied, but the main cause of the swelling was oedema. He had suffered from the affection for several years, sometimes better and sometimes worse, but never well. There was no evidence of venous obstruction. We took him into the hospital, kept him in bed, and bandaged his leg, and in the course of ten days he was so much relieved that he insisted on going out. He said that on several former occasions he had obtained great benefit in a similar way, but that it was always merely temporary. His general health was good, and he attributed the attack, if I remember rightly, to a bruise.

I have next to mention two cases which may, I think, be very suitably compared together. One

of them I shall be able to show you, as she is at present in the hospital. The other, whose case I will narrate first, is a young lady whom at intervals I have seen occasionally during the last five or six years. She is a patient of my friend Mr. Square, of Plymouth. Her age is about twenty-four, and she has suffered from her remarkable malady for the last ten years. Both legs are affected, and are in the condition of smooth elephantiasis; both forearms are also, though in a much slighter degree, enlarged in the same manner. Her feet are comparatively little involved, owing probably to the support given by her boots. The hypertrophy above the tops of the boots is very great, the legs being at least twice their natural thickness. This statement applies to her condition when I first saw her. In August, 1871, when I visited her in Plymouth, the state of things was considerably better, although it had then, she said, somewhat relapsed. One and the principal measure of treatment had been to send her to a more bracing air. During an eighteen month's residence in Scotland her general health had been very good, and the size of her legs had very much diminished. After a few months' resumed residence in Plymouth, she again began to feel weak, and the elephantoid condition began to increase. We had, of course, attended carefully to bandaging the legs, and tonics in various forms had been administered during long periods. A remarkable fact in this case is that Miss —'s mother and grandmother had, as I was informed, both suffered from a similar disease in girlhood, and in both got rid of it as they advanced in years. None of Miss —'s brothers or sisters had shown any tendency to it. Miss —'s mother spoke in the strongest terms of her own experience of the relaxing effects of Plymouth air, stating that she, like her daughter, never felt well except when in a more bracing climate. In India, where smooth elephantiasis is common, it is generally met with in the natives of valleys which are damp and warm.

## Clinical Lecture

ON A

### CASE OF SUCCESSFUL LIGATURE OF BOTH EXTERNAL ILIACS FOR INGUINAL ANEURISMS.

By EBEN. WATSON, M.A., M.D.,

Professor of Physiology in Anderson's University, and Surgeon to the Royal Infirmary, Glasgow.

GENTLEMEN,—I have the pleasure of calling your attention this morning to a very rare occurrence in surgery—namely, the successful ligature of both external iliacs for inguinal aneurisms. The patient is the same Thos. M'C— whom I introduced to your notice at the beginning of the present session. I then described to you the history and results of ligature of the *left* iliac for inguinal aneurism, performed by me on the 1st May, 1875.\* I now show you the man cured of aneu-

rism of the right common femoral by ligature of the *right* iliac artery, which I performed in your presence on the 19th January, 1876; that is, eight months and nineteen days after the previous operation. In Mr. Erichsen's "Surgery" you will find reference made to a similar case, in which Mr. Tait tied both iliacs successfully, at an interval of eleven months between the operations. I do not know of any other such case on record.

After the first operation M'C— remained quite well, and was able to resume his work as a shoemaker; but on the 17th November, 1875, he returned to the hospital complaining of violent headache, or rather of a violent pain on the right side of the head, said to be quite of a peculiar nature. Ordinary remedies had no effect on this pain, and I began to wonder if it could be due to some intracranial aneurism. I did not, however, make out any bruit; and as the man had once had syphilis, I put him upon full doses of iodide of potass, on the theory that the headache might be periostitic in its origin. Soon afterwards the pain rather suddenly ceased, and the man declared himself quite well on the 24th November.

Nevertheless, he remained in the hospital, chiefly because I wished to show him to you, and to the Medico-Chirurgical Society of Glasgow. As before, he made himself very useful in the wards, but was not allowed to do any heavy work. It was only on the 27th of December last that he told me in passing through the wards that there was an unusual beating in his right groin, as if he had another aneurism there, and on examination such turned out to be the truth. The tumour was in the site of the common femoral, just under Ponpart's ligament, as large as a walnut, pulsating freely in all directions, and yielding a loud aneurismal bruit when listened to with the stethoscope. I immediately ordered rest in bed, and compression only with a sand-bag, because of the tenderness of a gland which was situated close to the aneurism.

Unfortunately the patient could not endure any form of pressure. I tried the abdominal compressor in several positions above the aneurism, and Signoroni's tourniquet further down. I even applied Carte's circular tourniquet below the aneurism, and on the tumour itself, but all to no purpose, and the man himself begged me to tie the vessel, as I had done before, on the other side. By this time the aneurism had considerably increased in size, and now measured three inches in length. The bruit was very loud, and a grating sensation was communicated to the hand when laid on the tumour, just as if the blood-current was displacing coagula in the sac as it passed through. A consultation of the surgical staff of the hospital agreed with me that ligature of the right external iliac should now be performed, and therefore, having put the man on low diet for a few days, and gently opened his bowels, I performed the operation on the 19th of January.

The limb was carefully wrapped in cotton-wool and flannel, and chloroform was administered, but he went under its influence with difficulty, had frequent attacks of retching and coughing, and occasionally during the operation came partially out of the anæsthetic stupor. His condition, therefore, was not such as made the operation easy, and it also happened that, after making the ordinary incisions through the skin, aponeurosis, and muscles, I found it very difficult to separate the transversalis fascia from the peritoneum; in

\* See THE LANCET, April No., 1876.

fact, I punctured the latter in scratching through the fascia, the unsteadiness of the patient and his not being thoroughly under the chloroform at that moment having much to do with this error. However, immediately recognising the mishap, I closed the puncture with a single stitch of catgut, and proceeded with the operation, which I speedily completed without further difficulty. I dare say that the trial of compression on this side served to condense the areolar tissue, which is usually found loose and easily torn between the transversalis fascia and the peritoneum. The pulsation in the aneurism was at once arrested, and never for a moment returned. Its size was also greatly diminished on the ligature being tightened. I ought to mention here that the ligature was of silk, prepared as before by being drawn through melted wax and carbolic acid. It was cut short at the knot, and after the carbolic spray had been freely used, the wound was closed with stitches of silver wire, a drainage-tube of oil-silk having been inserted at the upper extremity. Next day I removed the dressings and extracted the drainage-tube, as there was no discharge at all, and not the least tenderness on pressure. There was, however, considerable flatulent distension of the abdomen, constant sickness, and occasional vomiting. His pulse was 72 and his temperature 99°. I ordered him a calomel-and-opium pill twice during the day, and one of colocynth and henbane at night. Nevertheless he continued to vomit frequently until next day, when his bowels were freely relieved by an enema. The abdominal distension at once disappeared, and, in fact, he was quite well.

He was kept on mild, soft diet, and had no bad symptom after the second day—in fact, after he recovered from what I believe was a bilious attack, increased by the effects of the chloroform, which evidently disagreed with him both at the time of its administration and afterwards. The wound was frequently dressed, and healed rapidly without suppuration. By the 10th of February it had completely cicatrised, and the dressings were discontinued.

Six days after the operation it is noted in the journal that the blood in the aneurismal sac felt quite solid, and by the time the wound was healed its size had greatly diminished. It is now represented by a small hard mass, of a flattened form, underneath Poupart's ligament.

The patient's diet was improved, and he was allowed to sit up in bed. In doing so he seemed to have bruised or irritated a gland in the iliac region outside of the cicatrix, and it was painful for a day, but a poultice soothed the pain, and the swelling very soon entirely disappeared.

Almost all restrictions were now removed, and the patient is reported on March 4th as being out of bed most of the day. It will be noticed that in this case the wound was firmly cicatrised in twenty-two days, and the patient was well and out of bed in six weeks from the date of the operation.

I am glad to be able to show you this man to-day (7th of June), nearly six months after the second operation was performed. He has been quite well since then, and only now complains of weakness of the abdominal parietes, where the incisions were made, and where you saw a considerable bulging when he coughed. I believe that a double truss with large and flat heads will be the best remedy for this state of parts.

I also beg you to note that there is no fulness or tenderness in the site of either ligature. In both iliac regions the parts seem to be quite healthy, with the exception of the obliteration of the arteries there, which is complete.

This case therefore proves that prepared silk ligatures may be applied on the continuity of an artery, and neither cut it nor produce suppuration, for both of these ligatures still remain, I believe, around the iliac arteries where I placed them, the one thirteen months, the other six months ago. As to the exact state of these ligatures, the best information I can give you is the following:—On the 15th of last January I assisted the late Dr. Dewar to tie the femoral artery with a silk ligature prepared as mine were. Unfortunately the patient, who was an old man and otherwise ill at the time of the operation, only lived for twenty-four hours. I examined the artery and the ligature carefully after death, and found that the latter had ruptured the internal and part of the middle coats of the former, the rest of the arterial wall remaining sound. The parts of the coat which had been ruptured were turned in towards the centre of the tube, and glued with lymph and clot. The ligature was buried in lymph, and, on cross section was seen to be already intruded into by the cellular elements. I have little doubt that its fibres would have soon been further separated and encapsuled by the lymph, and thus preserved from change. Such I believe to be the state of the ligatures in my case. They are still holding the arteries, but they are, by this time, so incorporated with living tissue that they may continue there indefinitely, without causing any disturbance or irritation.

At the time when this man's case was interesting us all—namely, last winter—I made some experiments upon the durability of catgut ligatures in the living body. More perfect ones might easily be devised, and I may yet pursue the subject further; but in the meantime I shall give you the results we arrived at.

Exp. 1.—Three catgut ligatures, prepared as usual for surgical purposes and of different thickness, were tightly tied round a piece of wood and immersed in blood freshly drawn from a man's arm. In twenty-four hours' time no appreciable change in the ligatures had taken place. The knots on the ligatures were quite firm, and the ligatures themselves were not thinned. My notes do not contain any indication of a later inspection of the ligatures.

Exp. 2.—Three similar catgut ligatures were employed, and a double knot was firmly tied on each. They were then pulled through a sinus in a man's leg, as a seton, so that the knots were embraced by the tissues and bathed in the sero-purulent discharge of the sinus. In six hours there was no appreciable difference in any of them. But in thirteen hours the ligature of smallest size had entirely liquefied and disappeared. That of medium size had become soft and diminished in thickness, so that the knot slipped on being slightly pulled; in fact, the ligature actually broke on slight traction being made on it. The third ligature, which was of the thickest catgut used in surgery, had also very much thinned; the knot on it slipped readily, but it did not break.

Exp. 3.—Again three catgut ligatures, similar in all respects to those previously used, after having been knotted, were inserted in an abscess recently opened. In six hours the catgut was

bleached, but not otherwise changed. In thirteen hours the ligature of smallest size was softened, and the knot did not hold, while the others were unaffected; but after twenty-four hours' residence in the pus, all were found softened, thinned, and incapable of retaining the knot.

I ought to have stated that in Exps. 2 and 3 antiseptic dressings were employed, and in neither case was the pus at all putrid.

The question now comes to be whether or not the time—less than thirteen hours—is long enough to hold an artery with a ligature for the cure of aneurism; and the practical answer which must be given is that in *some* cases it would seem to have been long enough, while in others it was not. My experiments would seem to show that if supuration is entirely prevented, the catgut ligature will hold for twenty-four hours, or perhaps even longer; but as no surgeon can be certain of securing that condition, especially in deep wounds and in unhealthy patients, the propriety of employing catgut ligatures in such cases is rendered doubtful; whereas the successful case of ligature of both internal iliacs now before you goes far to prove the safety and the certainty of prepared silk ligatures in such cases, and the length of time which has elapsed since the operations greatly strengthens this conclusion.

## Clinical Lecture

ON

### STRICTURE OF THE URETHRA.

*Delivered at the Liverpool Royal Infirmary.*

By REGINALD HARRISON, F.R.C.S.,

Surgeon to the Infirmary.

GENTLEMEN,—The practice of this infirmary affords you abundant opportunities of observing the surgical disorders of the genito-urinary system, and of these cases of stricture of the urethra and the complications arising out of it form no inconsiderable proportion. Associated as I have been for some years with two of the hospitals in this town deriving a large number of their patients from the seafaring population connected with the port, my observation leads me to believe that amongst this class of the community stricture is a common disorder. And that it should be so is not surprising. Gonorrhœa, contracted on shore, in the debauch that frequently precedes the vessel's departure for some foreign port, breaks out two or three days afterwards. Treatment, except in the case of certain passenger vessels, is usually conducted by the captain or his mate, and not always with advantage to the patient. The old notion that every disorder consequent on promiscuous intercourse is "venereal," and must be treated by mercury, still prevails; and large doses of calomel, until profuse salivation is produced, is not rarely the only remedy administered for a gonorrhœal discharge. Some of the worst cases of stricture that I have seen have been occasioned, under similar circumstances, by resort to the most primi-

tive proceedings for the relief of retention of urine. In the absence of catheters from the ship's medicine-chest, or still more frequently, as I have found, from their rottenness, I have known instances where the wire from a soda-water bottle and an iron skewer have done duty in "forcing" a stricture. It is only a short time ago when a man was admitted into No. 1 ward with retention and a badly lacerated urethra, as a consequence of an attempt on the part of the mate of his ship to reach the bladder by the aid of a pointed piece of wood, roughly modeled to the shape of a bougie. In this instance the mate was more than professionally interested, inasmuch as he had occasioned the retention by kicking the patient behind the scrotum. The most remarkable piece of ingenuity some of you will remember as occurring a few months ago, where, after a sailor had endured for over three days the agonies of retention, an endeavor had been made to introduce through the urethra a piece of lead gas-piping, which had been devised, *in extremis*, for the purpose by the engineer of the ship. Unfortunately, however, this failed to effect the purpose. When I saw him on his arrival here, on the fourth day of retention, I found the urethra much lacerated, and it was with considerable difficulty that I introduced a catheter, and removed a large quantity of the most fetid urine imaginable. Relief, however, came too late, the man dying shortly after his admission with convulsions and uræmic poisoning.

Though deploring that persons should be placed by circumstances in such unfortunate positions, I mention these cases for the purpose of showing you that your field for observation in this department of surgery is by no means restricted to routine, or even to the freaks of nature or disease. In undertaking to say anything about the treatment of stricture, I am conscious that the subject is a well-worn one. Still, with all our plans of treatment, we have not arrived at anything like uniformity of practice, and as this is only to be obtained by taking the sum of our respective experiences, I feel less hesitation in bringing under your notice some conclusions which my own experience, chiefly gathered in the wards of this hospital, has enabled me to arrive at. These considerations I hope to place before you during my course of clinical lectures this session. In using the term "stricture," I reserve it, as Sir Henry Thompson suggests in his eminently practical work on Diseases of the Urinary Organs, for one kind of stricture—viz., organic stricture. "Spasm" and "inflammation" are conditions more or less transient, but do not constitute stricture in the acceptance of the term which is now generally adopted. The causes of stricture are various. Let me give a few illustrations. A patient has a venereal sore on his glans penis involving the meatus. When this heals a cicatrix is left. Cicatrices are more or less disposed to contract, and in this instance result in the narrowing of the urethral orifice. This condition was well illustrated by a case in No. 7 ward, where the same state of things was produced by an improperly performed operation for circumcision; a portion of the glans penis having been removed along with the prepuce. When the sore healed, the cicatrix contracted, and the patient presented himself here with a tight stricture of the meatus requiring division. Another cause of stricture amongst our sailor patients arises from injuries where the urethra becomes bruised

or lacerated. A man falls from aloft across a spar or a rope, and ruptures his urethra. If the patient recovers from the immediate effects of the injury, it is with his urethra scarred. Here we have the worst variety of stricture—traumatic—a form of the disorder more obstinate to deal with than any other. In our inquiries as to the cause of stricture, we find that by far the larger proportion of our patients attribute their misfortune, directly or indirectly, to previous attacks of gonorrhœa. Those who do so *directly* are disposed to look upon the stricture as the natural consequence of their previous mishap. Those who do so *indirectly* usually have something to say about the treatment employed and its bearing upon the subsequent formation of a stricture. It is worth our while for a moment to analyse the statements made by this latter class with the view of ascertaining how far their allegations hold good. "I was almost cured of my gonorrhœa, only a very slight discharge remaining, which I thought would go away of itself," is the statement of the patient who is convicted of his own indiscretion in having allowed things to go on from bad to worse. Others, again, seek refuge in referring their misfortune to the improper advice they have received. "I was told that it was only a gleet, due to weakness, which would go away by iron, tonics, and cold baths." Here we have illustrations of gleet terminating in stricture.

Now it is well for you, once for all, to understand that a gleet is not a disorder which is disposed to go away of itself; on the contrary, it requires careful and well considered treatment, and if it does not receive this—that is to say, if it is clumsily dealt with or not dealt with at all—it most probably ends in the formation of a stricture.

A gleet is to be regarded as indicative of the early formation of stricture. Nay, further, you will not do wrongly in regarding a gleet as the stage in the stricture-forming process when by your treatment you can promise your patient to restore his urethra to its normal condition; when a stricture is once allowed to become cicatricial in its character, you may palliate or adapt, but you can no more *restore* his urethra than you can by dissection or any other process remove a scar from his skin. You may moderate the inconveniences of a scar, but you cannot obliterate it. Let not, then, the curable stage of stricture pass by; at all events, let the onus of doing so rest with your patient, and not with yourself.

Again, it is very common to hear patients attribute their strictures to the use of injections in the treatment of their gonorrhœas. A considerable amount of prejudice exists in the public mind in reference to the use of these applications. Patients not unfrequently say, when consulting you about a gonorrhœa, "Do not order me an injection, as I understand they often occasion stricture." Is there any truth in such an allegation? Assuredly not, presuming, of course, injections are judiciously prescribed and properly used.

Let me remind you that the cure of gonorrhœa by specifics is essentially one on the principle of injection. For how do the drugs that act specifically on the urethra effect their purpose? How do we explain the action of copaiba, oil of sandalwood, creasote, and certain terebinthines, in the cure of gonorrhœa? Do not all these drugs exercise their therapeutic properties, by certain of their constituents, for the most part demonstrable, being

conveyed by the urine to the situation of the disorder? What is this but a cure by injection, or, to be etymologically correct, ejection? It is the urine of the patient that conveys the specific to the disease, just as the rose-water in your injection does the sulphate of zinc, or other astringents.

It is the abuse of injecting that is open to animadversion. Injections in the treatment of gonorrhœa only do harm when by reason of their composition or strength, they act as *irritants* to the mucous membrane.

In the ordering of urethral injections there are two rules which should be regarded:—1. Do not strain the urethra by the *quantity* of injection used. 2. Do not pain the urethra by the *quality* of the injection. A teaspoonful of fluid *put* into the urethra frequently is better than a tablespoonful *forced* in three times a day. This is a point upon which I have long insisted. In prescribing injections you should feel your way, adding to the strength according to circumstances. Some persons, it is well known, are far more sensitive to the action of remedies than others; and this applies equally to the urethra—"The temper of the urethra varies as much as the temper of the mind." An injection appropriate in strength to a *fast* gonorrhœa is like the proverbial drop of *rain* on the duck's back in the case of the *habitué*. I remember ordering one of the latter an injection well known as "the four sulphates." It cured him effectually, and without pain. A friend, hearing of the success, borrowed the prescription, and, without proper advice, used it. The consequences were, an acute attack of cystitis and a subsequent stricture. Surely it is only to the foolhardiness of the sufferer that such an unfortunate result is to be attributed.

And I would here remark that I have seen a great deal of damage done and suffering occasioned by the use of some of the nostrum injections advertised throughout the country as "infallible cures" and "preventives." Many of them contain ordinary astringents applicable to the urethra, in a very potent form. I caution you therefore against sanctioning their use.

These observations have been made with the view of showing that it is only by their improper use that injections are open to the charge of occasioning stricture. If they are prescribed in accordance with the rules I have given, you will never have cause to regret their use.

[Mr. Harrison then proceeded to speak of the pathology of stricture, illustrating his remarks with cases which have recently been under treatment in the infirmary.]

\* Brodie on Diseases of the Urinary Organs, p. 50.

**BLOOD DRINKING.**—An American publication contains the following: "Blood is becoming the fashionable beverage in Cincinnati, being a great remedial draught for invalids suffering with anemia and general 'run down.' The *Cincinnati Commercial* describes a place in John-street, where between two and four o'clock in the afternoon ladies congregate and drink blood, fresh from the slit throats of bullocks. They seem to enjoy it; but it is said to be not altogether conducive to health. At the slaughterhouses in this city, the River-consumptives may be seen almost any day drinking the life blood of steers; but as yet the custom has not become as fashionable as it is said to be in Cincinnati."

## Original Papers.

## THE SPHYGMOGRAPH IN MEDICINE.

OBSERVATIONS ON THE TRACINGS FURNISHED BY  
MANY CASES OF DOUBLE AORTIC MURMUR.

By C. HANDFIELD JONES, M.B. Cantab., F.R.S.,

Physician to St. Mary's Hospital.

(Concluded from October No., p. 448.)

24th to 100.4°, and by the next day to 98.4°. By the 26th the rheumatism had disappeared; the heart sounds were as before. The salicylic acid was taken every four hours after the first day; fifteen grains of potassio-tartrate of iron and fifteen minims of tincture of calumba being substituted for it on the 26th. On July 3rd he was up and

about, but was very pale, and both feet were notably anasarcaous.—8th: Specific gravity of urine 1022; not albuminous.

This case was undoubtedly one of valve-lesion from rheumatic endocarditis; there cannot be any suspicion of arterial degeneration or of uræmia. With regard to the tracings, those which I have figured and several others, taken at very different pressures, all agree in exhibiting signs of increased

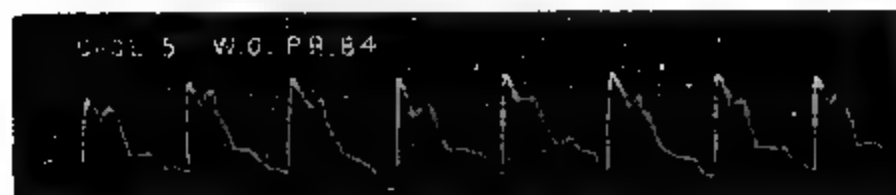
arterial tension. The effect of gentle exercise—walking a few minutes in the ward—as compared with repose was decidedly to increase the degree of arterial tension, as might be expected from the action of the heart being increased. The height of tracing (g) shows how dilatable the arteries

were. The contrast between (e) elevation and (f) depression of arm is quite similar to that in Case 8, and the same remarks are applicable to both. During elevation both tracings retain their tension-signs, though perhaps attenuated. The tracings on the right of (e) should be compared with those on the left by those who regard narrow peaks as produced by jerking of the lever away from the knife-edge (inertia), and not by true elevation from distension. If the four tracings on the right cannot be ascribed to inertia, why should the six on the left be?

CASE 5. Double murmur at midsternum, systolic in left side; radial pulses visible; dropsy; bronchitis; albuminuria; previous attack of gout; autopsy showed considerable lesion of aortic valves, hypertrophy of heart, sound kidneys.—W. O—, aged forty, laborer,

admitted October 3rd. Was in good health up to August 10th, then got bad cough, and his breath became very short. No expectoration. Lower limbs and scrotum greatly swollen. Urine contains some albumen and tube casts. Fine crepitant râles are heard over both lower backs; in left the breath-sound is weak. At midsternum a double murmur is heard, both systolic and diastolic portions being well marked over right third cartilage, over left the diastolic only. Up near the right clavicle the systolic portion is well heard, down near the xiphoid the diastolic. At left side, outside the nipple line, there is a loud systolic murmur. Radial pulses visible. Tracing shows marked delay of tidal wave. He has had gout in his feet two or three times; never had rheumatic

Was ill in same way before last April, and in October, 1872. Dulness in area of heart not increased; impulse visible and felt in epigastrium, less distinct at fifth space below nipple. At midsternum a loud rough double murmur heard up to right clavicle, and also, but weaker, at left second cartilage. The diastolic portion of the murmur is loud at xiphoid, and is well heard as far as left vertical line, but beyond this becomes feeble, and is hardly heard in the left side, and not at all in the back or at lower angle of scapula. The diastolic murmur is a large blowing sound. No second sound heard at midsternum and xiphoid. The systolic portion of the murmur is heard in the arteries of the neck, but scarcely at horizontal



fever. By November 2nd the anasarca had so much increased that—the urine being scanty—a small incision was made in front of each external malleolus, from which, in two days, about 140 oz. of fluid escaped; 70 oz. were collected in the first five hours. The breathing was relieved, but erysipelas came on; the temperature rose to 108° 3', and he died November 11th. The urine, four days before death, was albuminous, but free and clear.

**Autopsy.**—Both lungs much engorged, otherwise healthy. Heart weighed 21 oz.; its muscular fibre was of a good red color; the left ventricle walls were thickened, and its cavity enlarged. Mitral orifice a little enlarged, about half an inch, the valve flaps healthy. Aortic valve much diseased, the flaps thickened and shrunken, two of them fused together. Right ventricle somewhat dilated, the tricuspid orifice very much so, its valve and the pulmonary normal. Kidneys appeared quite normal, and all the other organs. The left leg was swollen, and an incision made about the calf showed the areolar tissue completely infiltrated with puriform matter.

Here the results of dissection were conformable to the physical signs, except that the kidneys appeared to be more healthy than the state of the urine might have led one to expect. Probably the albuminuria depended solely on venous congestion. The delay of the tidal or predicrotic wave shown in the tracing indicates, of course, increased arterial tension, rigidity of the radial wall being improbable at the age of forty. That such a state should have existed with both aortic and mitral incompetence would hardly have been anticipated. The result of the incisions would have been decidedly good but for the supervention of erysipelas. (More tracings should have been taken with different pressures, but I do not think that they would have shown essentially different features.)

**CASE 8. Several attacks of rheumatism, loud double murmur at midsternum; marked flat-topped tracing; no albuminuria.**—W. T.—, aged forty-five, cab-driver, admitted Oct. 4th, 1873. Ill fourteen days with pains in joints; copious sweating at night; pains in front of chest and in precordial region. Appetite lost, thirsty. Temperature 99°; pulse 90, of tolerable volume.

nipple line, or at vertical in fifth space. Tracings taken October 8th, most ample with pressure 28 grammes; the rise is high and vertical, the top flat or sloping upward, the fall shows but slight diastolic. Breathing fairly good in both lungs. The radial pulse was not easy visible unless the forearm was extended. No mention is made of the existence of any dropsy. The disorder was evidently mild articular rheumatism, which subsided, and he left the hospital November 27th. Urine examined October 10th and 18th; was not albuminous, sp. gr. 1012, 1018.

There can be no doubt in this instance that the aortic valves were deformed by rheumatic endocarditis, and rendered incompetent to close the orifice, and that this incompetence was more than slight. Yet the tracing is that of Bright's disease, or some other state producing great increase of arterial tension, and it is not materially altered by change of pressure.

**CASE 7. Old-standing cardiac disease; heart hypertrophied and dilated; mitral and aortic systolic murmurs; anasarca; orthopnea; urine not albuminous.**—M. M.—. Ill for many years with short breath and heart complaint. Three years ago had rheumatic fever for the fourth time, and ever since then her heart disease has been aggravated. Has been unable to lie down for some months; if she does, pain takes her under the scapula, and she has to fight for her breath. Her legs have been very much swelled. Pulse large, compressible, 96. Both backs well resonant; crepitations heard in all left, less marked in right. She coughs and spits a good deal. Heart's impulse extensive, felt at epigastrium, in precordia, a little outside nipple line, and as low as sixth space. Dulness area increased to left. Below nipple in left side, at midsternum, at right and left sterno-clavicular articulations, and less loudly in the arteries of the neck, a loud, blowing, systolic murmur is heard. It was also heard plainly at the xiphoid, but was not so loud there as at midsternum. Its maximum intensity was at the apex in left side. Radial pulse very superficial, just visible. Urine in fair quantity, not albuminous. Tracing on the 17th April shows a low rise, a



broad sloping top, a gradual fall, with little diastole.

There can hardly be any doubt that two murmurs existed in this case: one, that of mitral regurgitation; the other, that of aortic obstruction. The former condition probably did not affect the form of the tracing materially; I have not found it to do so when existing alone. The latter, by impeding the flow of blood into the aorta, produced the low primary rise and the marked delay of the tidal wave. I have added this case to the others—from which of course it materially differs—to show in what way obstruction tends to modify the tracing.

If these observations should be confirmed by others the sphygmograph may be used to distinguish between cases of double aortic murmur more exactly, showing when obstruction predominates, and when regurgitation. I close with a quotation from Dr. Galabin's paper, which seems to me of great value, and well worth bearing in mind by all who are engaged in these inquiries—viz., that, "If the tracing of any pulse taken at a low pressure shows a very marked primary summit, whose proportionate magnitude is modified by increase of pressure, then the tracing taken at the higher pressure more closely represents the true pulse wave. The form of tracing at the lower pressure may, however, have much significance, and in these cases the whole of the information to be derived from the sphygmograph cannot be compressed into any one curve, but requires at least two for its expression—namely, that trace which has the greatest amplitude, and another taken at a high pressure."

## ON CHRONIC ULCER OF THE STOMACH.

By JOHN RICHARD WARDELL, M.D., F.R.C.P.,

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THE affection which has been variously termed simple, round, chronic, or perforating ulcer of the stomach is by no means an uncommon disease; and it is very probable—from its latent origin, the absence of acute indications, the often ill-defined and hardly to be said pathognomonic symptoms, and the close resemblance between such symptoms and the symptoms of mere dyspepsia and gastric catarrh, and from its presence sometimes being overlooked on inspection when there had been no suspicion of the complaint—that it obtains far more frequently than is generally supposed. The ancient writers knew of, and Celsus especially comments on, the affection. Several of the older authors speak of it; and amongst these, the account of Morgagni, from its truthfulness and delineation of the facts, may in particular be mentioned. But the best, amplest, and most correct descriptions are by more recent and contemporaneous pathologists; and most especially may be named those by Cruveilhier, Rokitsky, and Virchow on the continent, and Budd, King Chambers, Brinton, Habershon, Crisp, and Wilson Fox

in our own country. These physicians have pointed out many distinctive characteristics of the ailment, and given much valuable information relative to its clinical history, its pathology and treatment. From the correcter knowledge which we now possess of gastric ulcer and of its symptoms and phenomena, it is by no means improbable that the older physicians mixed up and confounded with ~~the~~ cardiacgia, hæmatemesis, and melaena, which are merely coetaneous events or sequents of the malady; and though each or all of these conditions may accompany the progress of gastric ulceration, yet there are cases in which even none of them are produced. It is not a disease of early life; it most rarely occurs before puberty, and the examples which have been given of its coming on before this time are rare and exceptional instances, and most probably some of the few recorded were really rather referable to cadaveric change, as it is not unfrequently an arbitrary decision which elects between such change and the more moderately pronounced but veritable process of ulceration. Nor is it at variance with fact that the same kind of mistake is liable to take place in other portions of the digestive surface. It is a disease which increases in frequency with advancing years. According to some statistics, its greatest liability has been found between twenty and forty. It has been roughly estimated that it is perhaps about three times more prevalent in females than in males, and this estimate seems to be borne out by the elaborate tables of Willigk, Miguel, and Crisp. From very large data deduced from observations after death, it may be safely said that ulceration of the stomach or duodenum is discovered in about the ratio of three per cent. of the deaths from all causes. Dahlerup, of Copenhagen, records a great excess of this number, and places the average as high as thirteen per cent. of all bodies examined. According to the calculations of Brinton, something like thirteen or fourteen in every hundred cases perforate. On the whole, it may be said that the poor and ill-clad and ill-fed are more liable to it than the rich. Copland long ago gave it as his opinion that domestic servants and seamstresses are particularly subject to this complaint. Most writers concur in believing that between amenorrhœa and this pathologic change there is some absolute but ill-understood correlation. Miguel thought the climacteric period, from forty to fifty, produces an influence favorable to the development of gastric ulceration; and Crisp has given facts which seem to point to the conclusion that perforation is rendered more probable in those instances in which there is irregularity in the uterine functions. Rokitsky says intermittents produce them; Engel averred that in ten per cent. of the cases which he had witnessed syphilis appeared to be the cause; and Krauss does not hesitate to attribute the ulceration to hæmorrhoids. There is no doubt that in an anæmic and cachectic condition of the system, in which there is blood-change and a generally lowered vitality, this form of ulceration is liable to supervene. Again, change in the calibre of the gastric arteries is doubtless not unfrequently a more direct or proximate cause; while change may ensue after severe vomiting, mechanical injuries—as by blows, tight-lacing, girdles, and the like. From the knowledge which we now possess of the morbid phenomena produced by embolism in the brain, the liver, the spleen, and other organs, it is very

presumptive that organic cardiac disease importantly enters into the etiology. Embolism may be carried into the gastric arteries, choke up a branch, and be followed by a circumscribed and destructive process. Virchow gives great prominence to embolic obstruction as a cause; and there is no doubt that chronic catarrh of the gastric surface, which in the course of time is succeeded by disease of the vascular walls and thrombosis, ought also to be instanced in the causation.

The following cases will illustrate the affection as it is sometimes observed.

**CASE 1.**—In April last I was requested to see Mrs. P——, a married lady, who had been under the care of an eminent London physician, and who was sent to Tunbridge Wells for the benefit of her health. She had had several children, was forty-five years of age, and she told me that her case was regarded as ulceration in the lining coat of her stomach. There was no emaciation, but she looked pale and anæmic, her pulse was feeble, her appetite impaired, and the bowels were inclined to be costive. She lived in a central part of London, and was much in the house. She stated that for a long period her appetite had been impaired, that there had been pain and fulness after meals, and that at times she was troubled with acid eructations. About twelve months before I saw her she had suddenly vomited a considerable quantity of blood. Since that event her health had been more delicate, and there had been general loss of strength. She had for long been strictly dieted, and regarded herself as an invalid. There was some tenderness and fulness at the epigastric region, with occasional pains, but no tumour or hardness could by manipulation be detected. The other abdominal and thoracic viscera gave no evidence of disease, and it was quite clear, both from the objective and subjective symptoms, that her chief trouble lay in the stomach. A few days after my first visit I was suddenly sent for, as she had vomited a quantity of blood. On my arrival she looked pale and exhausted, and the pulse was rendered soft and quick. She complained much of sickness, and placed her hand over the stomach, where, she said, there was a feeling of weight and discomfort. In a short time more blood was vomited, and she altogether lost nearly a pint. She was placed in the recumbent position in a cool apartment, iced drinks were given, and she took ten-grain doses of gallic acid in thin mucilage every two hours during the remainder of the day. Small quantities of iced soup were at the first only allowed. Hot appliances were put to the feet, and strict injunctions were made that she should be as quiet as possible. The bleeding not returning, the medicine was administered at longer intervals, and for some days she kept her bed, and only took iced food and drinks. In the course of time quinine and sulphuric acid were prescribed, and afterwards the tincture of the perchloride of iron. At the end of between two or three weeks she returned to London. I recently heard that this lady had had, up to that time, no recurrence of the hæmorrhage, and that her general health had improved.

**CASE 2.**—On the 1st of October, 1878, I was hastily sent for to see Mrs. H——, a married lady aged thirty, who, it was reported, had "burst a bloodvessel." On my arrival I was shown about half a pint of red, bright-colored blood, which she had just vomited. The patient was lying on the

bed, exceedingly pale, and evidently much exhausted. She was of thin and slender frame, and looked younger than her age. It was reported that about sixteen months prior to the above date, one evening when seated at tea, she momentarily felt her mouth to be filled with fluid, became sick, and vomited nearly a pint of blood. The hæmorrhage did not then return, but since that occurrence she had been much invalidated. Without loss of time, she took ten grains of gallic acid in thin mucilage, and small quantities of iced drinks were given at short intervals. The hæmorrhage recurred two or three times subsequently, at intervals of a few hours, and her pulse and general prostration became very alarming. For a time she lay in a semi-unconscious state, the pulse being quick, small, and compressible, the skin cool, and a feeling of nausea being very persistent. Her condition having assumed so serious a character, I was requested to sleep three nights in the house, in order to be at hand in the event of a return of the hæmorrhage. Her general weakness being afterwards so exceedingly pronounced, her friends wished Sir William Gull to be sent for; he, however, not being at home, Dr. Habershon came in his stead. I had then given her both the gallic acid and doses of turpentine. When Dr. Habershon saw her, he thought the bleeding might not return, and advised the continuance of the remedies a little longer. He also recommended, if more blood should be vomited, the free use in large doses of the tincture of the perchloride of iron. The hæmorrhage did not recur. This lady was an American, and subsequently to her first attack she had consulted some of the most eminent practitioners in New York, and the opinion had been given that her complaint was that of chronic gastric ulcer, in which Dr. Habershon fully coincided. For many weeks she remained in an extremely weak and fragile condition. She took quinine and iron, and from time to time other tonics; the bowels were kept open by mild laxatives, and very rigid rules were laid down in respect to her diet. I last heard of this patient through Dr. Habershon, who told me there had not been any more hæmatemesis, and that she seemed to have greatly recovered her general health. During the first forty-eight hours of my attendance, I very much feared death by syncope. It must, however, be borne in mind that alarming quantities of blood may be vomited in hæmorrhage from the stomach, and still recovery be the result, as I have repeatedly witnessed.

**CASE 3.**—The next example which I now give was one very typical of the slow but persistent progress of this complaint. On March 28th, 1870, I was requested to see Miss P. L. G——, a young lady twenty-six years of age, of whom I was told that she had been for several years an invalid. Her volume of flesh was good, nor was there any marked expression of disease in her countenance. I was also informed that about two years prior to the above date she had had for a long period persistent nausea and vomiting, and so continuous and distressing were these symptoms that her medical advisers then feared the consequent exhaustion would end fatally. She slowly recovered from that attack, and in the course of time could digest a prescribed diet. She, however, remained much of an invalid. She had consulted some of the leading men in London, and all whose advice she sought concurred in the opinion of gastric ulcer.

She had repaired to various places for change of air and climate at home and on the Continent, and at length came to Tunbridge Wells. When I first saw her she was in bed, and she told me that during the previous three days she had had a return of sickness and vomiting. Her food could not be retained, and, immediately after taking any nourishment, it was ejected. On inspection of the abdomen, there was a rounded fulness over the stomach, and on palpation moderated pressure produced epigastric pain. The line of hepatic dulness slightly exceeded the costal edge, but there was no splenic enlargement. The physical signs of the thorax gave no notable characteristics. The tongue was moist, but coated on the dorsum. Pulse 84, small, regular, and compressible. Bowels confined, and last evacuation was dark and biliary. She was ordered small doses of the bicarbonate of potash, morphia, and hydrocyanic acid. I was in constant attendance on this young lady for some weeks, and the nausea and sickness, beyond very temporary alleviation, defied all remedies. Various medicines were prescribed, but with no satisfactory effects. She had morphia, *Lobelia*, *conium*, prussic acid, creasote, belladonna, and opium. Sedative suppositories, stimulating injections, counter-irritants, and ice to the spine, were tried, but without producing any marked relief. Concentrated soups, milk, and lime-water, jellies, and other bland nutrients, were ordered, but even these were as a rule rejected. Iced champagne was better retained than any other stimulant. When such a scanty amount of ingesta were kept in the stomach, it was not wondered at that she gradually lost flesh and strength. As time went on the wasting became more and more apparent, the lips became dry and parched, and the tongue covered with a silvery coat, the tip and edges looking red and irritable. The eyes assumed a sunken appearance, and seemed small in their foramina, and the facies hippocratica ere long was marked, and expressive of her slow but sure decline. With these ominous changes the pulse indicated the diminished column of blood passing through her heart; it was weak, thready, and irregular. Three days before her death the cerebral functions succumbed in the general loss of vital power; she looked around her with astonished gaze in hazy bewilderment. Utter unconsciousness supervened, and she tranquilly sank on May 7th, 1870. This instance of the disease well illustrated one mode of death which ushers in the final termination—that in which there is gradual and unarrested extinguishment.

CASE 4.—*Caroline T*—, aged twenty-four, single, a domestic servant, was admitted to the infirmary April 19th, 1870. She was well formed, muscular, and her general aspect did not indicate any important disease. She stated that some years before she began to have attacks of sickness with occasional vomiting, and these attacks would continue for two or three months, and then pass off. In November, 1868, she became an inmate of Guy's Hospital, and remained in that institution five months. She was discharged as cured, but was warned that the disease might return. In August, 1870, she became an out-patient of the Tunbridge Wells Infirmary, under the care of the then house-surgeon, Dr. De Havilland Hall. The leading symptoms of her complaint were constant nausea and occasional vomiting. The ejected

matter sometimes contained blood. On examination at that time there was no marked epigastric dulness, but on circumscribed pressure pain was felt at the stomach, and sometimes this pain radiated through into the back. The appetite was impaired, the bowels were confined, and the tongue was covered with a whitish fur. Pulse and temperature normal. She was treated with a variety of remedies, such as opium, prussic acid, bismuth, alkalies, bitter infusions, and counter-irritation. The diet was carefully directed, and no solids whatever allowed. She made no progress, and at length was admitted as an in-patient into the infirmary. On admission she still complained of pain on moderate pressure being made at the epigastrium. She was also harassed with nausea and occasional vomiting. She was kept in the recumbent position, and various remedies in turn were tried. She derived the most benefit from small and regularly-repeated doses of opium, with the sulphate of copper, in the form of pills. The bowels were acted upon by aqueous extract of aloes in combination with the extract of belladonna. She lived chiefly on soup, crumb of bread, milk, and farinaceous food, lime-water being given with the milk. Under this treatment the sickness and vomiting gradually declined, she could digest more food and had less pain on pressure being made over the stomach. In the latter part of June she sat up for a few hours during the day, and was allowed a small quantity of mutton with some well-cooked vegetables. Her progress now became quicker, the nausea seldom occurred, the vomiting had entirely ceased, and she could bear pressure at the spot where before she always had more or less pain. On July 20th she was discharged, looking healthy and well. Appended to the above particulars of this case in my note-book is the remark that "continued rest in the recumbent position, and the strict rules observed respecting her diet, were most likely in this patient of more service than any medicines which she had taken."

CASE 5.—This example is one of much interest, and exceptional in this disease. *W. I. C*—, a house-painter, aged thirty-six, of fair complexion, and not emaciated, was for several weeks during the summer of 1868 an out-patient of the Tunbridge Wells Infirmary. He applied at the Institution for what he termed a "stomach affection," which was characterised by some pain after meals, which extended through the epigastrium into the back; and he stated that he had occasional attacks of sickness and vomiting. Four years previously had suffered from painter's colic, which was followed by lead paralysis in both arms, and in each had the kangaroo drop. Three years previously, he had for some time been much troubled with nausea, and then not unfrequently vomited his food. From the last-named illness he gradually recovered, and continued in tolerable health, with the exception of sometimes suffering from pain in the stomach, accompanied with a feeling of sickness. In the latter part of July, 1869, these symptoms became worse. I then examined him, when gastric tenderness was felt on pressure, but no tumour or any indurated enlargement could be detected on careful manipulation at any part of the epigastric region. He was treated in the ordinary manner, and carefully dieted, but without any marked relief. On the 18th of September

he had unusual pain after a meal, the vomitings were frequent, the acid eructations incessant, and it was but too evident that his complaint became worse. In the evening of this day, the house-surgeon, Dr. De Havilland Hall, was hastily summoned. He found that the patient had vomited nearly half a chamber-utensilful of dark blood mixed with coagula. The patient said he felt very faint before the vomiting came on. The skin was cool, the pulse feeble, and there was a tendency to syncope. Gallic acid in full doses and iced water were ordered. On the morning of the following day it was reported that he had passed a good night. He felt comfortable, with the exception of a feeling of nausea. The bowels had been moved, and the defecation was of pitchy blackness, evidently caused by the great admixture of blood. He was ordered prussic acid, with a little bitter infusion; some bland nutrients, small quantities of which were to be given at short intervals; and rest in the recumbent position was enjoined. About nine o'clock in the evening he had another and most alarming attack of hæmatemesis, the floor and bedclothes and bedding being drenched with blood. The patient was rendered rapidly prostrate. The pulse became small and compressible; the skin was cool; there was no pain; and the mind remained clear and collected almost up to the time of his death, which occurred eleven hours after this his last vomiting of blood.

*Autopsy, thirty hours after death.*—Features and surface of almost marble whiteness, and the body did not appear emaciated. Thoracic organs healthy, but exceedingly bloodless, the cavities of the heart and great vessels being utterly empty. On opening the abdomen a small quantity of dark sanguineous-looking fluid was found in the sac of the peritoneum. On removing the stomach, it contained some dark coagula. At the greater curvature, and nearer the pyloric than the cardiac end, a round cleanly-punched hole, the size of a fourpenny piece, was discovered. On washing the organ and carefully examining the place where this solution of continuity had occurred, the mucous and muscular coats showed a crater-like ulceration. The edges of the ulcer were smooth, rounded, vascular, and elevated above the surrounding tissue. Its narrow apex and funnel-shaped basic expansion towards the mucous surface, when carefully looked at, seemed in terrace-like irregularities, and an amorphous or finely granulated substance covered these strata of the tissues. The subperitoneal cellular formation was augmented in thickness, being rendered more firm by an adventitious and infiltrated product. At about three lines' distance from the elevated annular margin before described was a finely injected zone, which did not rise above the mucous surface. Examined on the peritoneal aspect this perforation was clean at the edges, as if incised, there being no ragged line, nor any lip-like protrusion, which would have marked the difference had the opening resulted in cadaveric rupture. In cadaverous slit there is no internal thinning and beveling off of the inner coats—the rent has the appearance of an ordinary tear. Not far from this place of ulceration were seen two other smaller ulcers, in which the morbid process was less advanced. Not a trace of peritoneal inflammation existed either in the stomach itself, or in any neighboring parts. The solid organs on being

incised were notably pale. No other indications of disease were anywhere revealed in the abdomen.

CASE 6.—The last example now given, and in which it is presumptive that there was gastric ulcer, was in the case of Mrs. B—, a married lady, aged forty. This patient was born in India, and had passed her childhood there, but since then she had not been in that country. She was rather inclined to be stout than the contrary, and, upon inquiry, the catamenia had not for some time been regular. I was first requested to see this lady in December, 1873; she then looked pale and anæmic, and I was informed that she had been more or less an invalid for some years. The thoracic signs were normal, but, on examining the abdomen, I discovered the spleen to be exceedingly large; it depended below the costal edge; the line of dullness could be traced up above the upper margin of the eighth rib, and, on placing the tips of the right hand fingers at the sulcus formed at the outer border of the dorsal muscles, and the ends of the left hand fingers being pressed in the epigastrium, and on a gentle jerking push being made from right to left, the large and indurated spleen could be distinctly felt tilted almost as far as the mesial line. Its smooth and rounded edge was significant of the notable enlargement of the organ. This lady had for years complained of a depending dragging sensation in the left side, and she could not lie in comfort on the right side. Her greatest trouble, however, was the persistent uneasiness which she experienced immediately below the ensiform cartilage; pain after food, flatulent distension, and sour eructations had long been from time to time distressing symptoms. Occasionally these feelings were associated with nausea and vomiting. She was under my care for some months subsequently, when for a time she left Tunbridge Wells. On Sept. 2nd, 1875, I was again sent for to see this patient, who sought relief from her former malady. She had pain at the epigastrium, which was augmented on moderate pressure, and there was a continuous feeling of sickness. During the subsequent few days she received some alleviation from the treatment adopted. On Sept. 8th I was in great haste sent for, and, being from home, my friend Dr. Milner Barry attended instead of me. He found she had vomited a large quantity of blood, and he prescribed turpentine and iced drinks. On my return home three hours afterwards I saw the patient, when the hæmorrhage had not ceased. The turpentine was repeated, but the vomiting of blood returned. I then tried gallic acid, but not with any marked effect. An ice-bag was placed on the epigastrium. I then commenced with thirty-drop doses of the tincture of the perchloride of iron, and, after the administration of this remedy, the bleeding began to decline. Very great prostration was induced, with approaching syncope. I remained in the house all the night, and the patient was doubtless in a very precarious condition. She vomited more than four pints of blood. For many hours the pulse was very small and compressible, the heart's impulse subdued, and the features became exceedingly blanched. During several days copious pitchy evacuations were passed, proving how great a quantity of blood had flowed down into the bowels. On subsequent examinations of the abdomen, the spleen by the hæmorrhage had been very manifestly lessened in volume. Three or

four months passed over before this lady regained her wonted condition of strength. Her recovery was slow, and the pallor for a long time remained in a marked degree.

(To be continued.)

## ON THE TREATMENT OF DEFECTIVE UTERINE INVOLUTION.

By EDWARD JOHN TILT, M.D.

If it was right to consider defective uterine involution as, to a great extent, *the workshop of uterine pathology*, the matter in hand is important, for there is evident danger of some disease setting up, in a womb that remains much larger than it ought to be several months after delivery.

There is firstly to be considered the right performance of what should be a natural function; so pregnancy and labour should be managed in order to ensure the maintenance of sufficient reserve-force when the system shall be called upon to reconstruct the womb; and I think Dr. Bassett\* is right in urging that many women want more medical treatment than they usually get during pregnancy—that they want tonics, and, above all, iron. It is also clear that whatever prolongs labour and exhausts strength augments the chances of defective involution. It is, moreover, fair to conclude that too long-continued contraction of the uterine muscle leaves it half paralysed after delivery, and that its overstrained muscular fibres can no more properly contract, than can the muscular fibres of the over-distended bladder after the urine is removed. I therefore look on the present tendency to shorten labour by instrumental interference, so soon as it can be safely done, as well calculated to prevent involution becoming defective. Those who object to medical treatment during pregnancy, and to the expediting of labour, on the plea of interference with natural functions, should bear in mind that we have to do with women considerably modified by hereditary tendencies, and by the bad hygienic habits that always wait on a high state of civilisation. Some of the women we attend have never done a hard day's work till labour pains set in.

The giving a full dose of ergot as the head emerges, and Credé's method of removing the placenta, tends to prevent post-partum hæmorrhage, and gives the womb a proper shape, by making its muscular fibres fully contract in the right direction; for however firmly it may at first contract, the womb soon relaxes; for it is in the midst of the fast-decaying elements of worn-out muscular tissue, that a new womb is built up, just as in dissolving views we see new forms arise in the very midst of structures that rapidly melt away. It can therefore be of no use to apply firm pressure to the womb after the first few hours of delivery, and a bandage then should have no other object than to give the abdominal viscera that support they cannot get from relaxed abdominal walls. Should there be a previous history of some uterine distortion, attention should be given to the patient's posture in bed. She should be told to lie as much

as possible on her back if the womb had previously been anteverted or anteflexed; and, on the contrary, to lie as much as possible on the face and stomach if, as is more frequently the case, the womb had been retroverted or retroflexed. Are we right in scrupulously keeping women on their backs for nine days after confinement? Would not the gentle pressure of the enlarged womb by conterminous organs, supported by the varied play of the abdominal muscles, not only prevent the stagnation of decomposing fluids within the womb, but give it a better chance of growing to a proper shape and size than it does under the plan generally adopted in the treatment of puerperality? I think it likely, considering the good results obtained by Dr. Goodall in the treatment of 700 women at the Preston retreat, near Philadelphia; and a good idea of the institution, and of the practice there followed out, may be gathered from the following extract taken from Dr. Goodall's pamphlet:—

"The institution contains twenty beds, divided amongst four wards, five in each ward. The cubic capacity is about 1800 feet for each bed. About one hundred married women are delivered yearly. They are admitted, on an average, about sixteen days previously to confinement, and allowed to stay a month; they, however, generally only remain about eighteen days. The air admitted into the rooms is heated in the basement, and ventilation is maintained by a small jet of gas in the old-fashioned fireplace. Outside the hospital, puerperal fever was rife of late years. In Philadelphia and the city of New York, the mortality from puerperal causes (acknowledged as such) has been as high as one in forty-five, amongst all classes alike; if anything, more amongst the wealthier. The wards are used in rotation, one always being kept vacant for about two or three weeks. When a ward is emptied, the doors and windows are kept constantly opened until it is used again, and the whole of the walls, beds, furniture, and floors are scrubbed down with carbolised soap, and then mopped over with a weak solution of carbolic acid. No water is allowed to be used to the floors until the ward is emptied again. The nurses belonging to the ward go off duty for a week when it is closed, and go through a thorough system of purification. The beds are of straw, which are changed with each patient, the blankets and bedclothes being boiled in water with a small quantity of carbolic acid added. The feathers of the pillows and bolsters are only baked once a year, unless they should become soiled or have been used by a patient whose convalescence has been retarded. Every woman has a bath at least once a week before delivery. Any indication of enfeebled health is at once treated with quinine, steel, and phosphoric acid. Headaches and sleeplessness are dealt with by warm baths and large doses of bromide of potassium. The bowels are kept relaxed and purged. As soon as labour begins, the patient is placed in a warm bath. The membranes are generally ruptured artificially. The second stage is never allowed to be prolonged, the forceps or vectis being used. .... Ergot is not given as an oxytocic, but as soon as the head comes to press on the perineum, a drachm is given. Should the perineum be torn, it is sewn up at once with silver sutures. A cylindrical compress is applied just above the fundus, and a tight binder applied for twelve hours, when it is removed, and

\* Transactions of the Obstetrical Society of London, vol. xvi.

not used again. The patients are confined on a delivery-bed, and wheeled into the ward and removed to their beds. In not a single instance has flooding ever been caused by this muscular movement; if anything, it has rather tended to excite uterine contraction than otherwise. The next day after delivery the woman slips out and sits in a chair whilst her bed is made; this is repeated once or twice a day until the fourth or fifth day, at which time she may get up, dress herself, and do what she likes. No patient is forced to leave her bed, but the force of example is so great that most do. After-pains are immediately removed by quarter-grain doses of morphia, given every hour until relief is obtained. If they be very obstinate, ten grains of quinine are given every six hours until the ears ring. It is an invaluable remedy in these cases. There are no ped-pans; vaginal injections are employed. Every woman washes herself daily with carbolic soap and a pad of fine oakum. No nurse, except for some special reason, is ever allowed to wash the woman's person. If the lochia be offensive, she is taken out of bed more frequently, and placed on the chair. Should this not succeed, a vaginal injection is then used."

There is a strong presumption in favor of the belief that suckling has for one of its secondary purposes to stimulate the womb while in a transition state of structure. I have long ago confirmed Aran's assertion respecting the frequency of uterine disease in those who do not suckle, and this may be partly owing to defective involution in such women. Since I wrote on the subject, both Schroeder and Schneider aver that suckling promotes involution, and Serdukoff has satisfied himself that up to the first week of puerperality involution proceeds more rapidly in those who nurse than in those who do not. I am therefore among those who think the accoucheur should not leave the house without having seen the child applied to the mother's breast. Besides favoring involution by the singularly powerful effect of mammary irritation on the ovaries and womb, suckling also checks menstruation, and a few months' rest from menstrual congestion enables the womb to better recover its right size. The child will of course have to be weaned if he cannot thrive on the maternal milk; and, on the other hand, should the cervix be much ulcerated, suckling is very likely to prevent its cure by the usual surgical treatment, in which case also the child should be weaned.

What precedes relates to the prevention of defective involution. I pass over the most interesting part that it takes, during the first fortnight of puerperality, in the production of hæmorrhage, in the retention of decomposed fluids, in the production of puerperal metritis, lymphangitis, phlebitis, and fever, to direct attention to sundry morbid states that are to be observed a little later, that check involution by bringing on what is commonly called "*a bad getting up*."

There is always considerable debility caused either by length of labour, loss of blood, or nervous shock—debility requiring iron and quinine as well as wine and food. Everybody admits this requirement, and meets it more or less judiciously; but puerperal traumatism is little understood, and often completely unsuspected as the cause of a bad getting-up.

If a woman dies within forty-eight hours after delivery, the tissues of the womb will be found as

black as ink. This bruising of the womb, the vagina, and subjacent tissue, is generally cured by nature; not so the fissures and rents of the cervix, simple or stellated, in weak and unhealthy subjects. I have already mentioned their frequency as admitted by the late Dr. Phillips and Dr. Athill of Dublin; and the more frequent use of the forceps now advocated by the best men will inevitably increase the number of such lesions, for some will use instruments without being thoroughly up to their management, and others will not always wait to use them till the os uteri is fully expanded. Thirty years of practice have made me certain of one thing—that each of these rents that refuse to heal of themselves may, by checking involution and in other ways, be the starting-point of long years of uterine disease, often characterised by considerable uterine enlargement and hardness. With this conviction, I may be permitted to view with dismay any theory that would treat lengthily of uterine hardness and enlargement, in women who have borne children, and which did not take into consideration the frequent origin of such states in traumatic lesions of the cervix.

To check such lesions in their earliest stage, the best way is, after every case of labour, to suppose the existence of traumatism in the cervix and vagina, and to order vaginal injections to be made so soon as the lochia should cease to be red. I know of no better injection than a solution of acetate of lead, one drachm to the pint of tepid water. There is no likelihood of such an injection entering the uterus, and the chance of the occurrence of the uterine tormina that occasionally follow the use of injections, or the chance of some accidental awkwardness in the use of the instrument, is as nothing compared to the benefits generally derived from the practice. I recommend the practice as a matter of routine, without any previous examination of the patient, as not calculated to do harm, even if it be not wanted. If, three or four weeks after confinement, a bad getting up is notable for a vaginal discharge, bloody or mucopurulent, the patient should be carefully examined, and it will be found that uterine involution is being checked by some more serious lesion than congestion or subacute inflammation of the cervical mucous membranes. I refer to my Handbook of Uterine Therapeutics for the treatment of the chronic inflammatory lesions that grow out of puerperal traumatism.

The somewhat independent life and pathology of the neck and of the body of the womb is sometimes shown in the process of uterine involution, for the cervix may have nearly recovered its normal size and consistency, while the body may still remain large and flabby. Thus a large soft bag, being poised on a cervix already stiffened to its usual consistency, is ready to yield to the laws of gravitation and to bend at their point of junction in obedience to slight pressure. This is a very satisfactory explanation of post-partum flexions and versions, and it holds good to a great extent for those that follow abortion.

To explain these occurrences in the virgin womb, there is the over-weighting of the body of the womb, by repeated attacks of insufficiently relieved congestion or of inflammation, and in other cases the congenital imperfection of some part of the womb or of its ligaments; for, with regard to any considerable amount of softening of the virgin womb, in delicate young women, which has been

lately asserted to be of not unfrequent occurrence, Dr. Henry Bennet, and some other gynecologists to whom I have spoken on the subject, are like me in not having met with such a condition. It follows from what I have stated of the possible separate rate of involution of the cervix and of the body of the womb, that, supposing a considerable amount of cervical ulceration be found two or three months after parturition, this should not be taken as the sole lesion, for involution may be defective in the body of the womb, albeit complete in the cervix. There is no better way of promoting involution in such a case than by properly treating the cervical inflammation, and I have already related a case in which the gradual involution of both body and cervix was brought about by the application of a strong solution of nitrate of silver, the cervix being without lesion. When the womb is found much too large several months after confinement and without cervical lesions, I order a ten-grain mercurial suppository to be put up the vagina, on going to bed, for the first fortnight, and afterwards on alternate nights, for two or three weeks, telling the patient to inject plain water in the morning, and a solution of alum and zinc at night. The exhibition of the mercury should be stopped if the gums show signs of impending salivation. In all cases of defective involution, with or without cervical inflammation, I give the usual doses of iron and strychnia, to act on the womb through the system, and also ergot, although it is difficult to understand that it can act as well on the womb in a state of mutation as on the uterus in its ordinary state of nutrition-stability. When the womb is found large enough to admit a bougie to the depth of about four inches, and when this enlargement can be traced to a delivery that occurred a year or more previously, it is fair to attribute this enlargement to defective involution, but its treatment merges into that of one or more complications that will have certainly arisen in that time—displacements, internal metritis, hypertrophy, or chronic inflammation of both body and neck of the womb. I shall say nothing of the treatment of such complicated cases, except that when defective involution is associated with an enlarged and hard cervix, lined with a diseased mucous membrane, nothing is better calculated to reduce the size of both the body and of the neck of the womb than an issue made in the most accessible part of the cervix, by means of *potassa fusa cum calce*, the wound being freely swabbed with tincture of iron on alternate days for the following month. There should be no surgical treatment for the following three months, after which a second application of *potassa fusa cum calce* is often advisable.

Notwithstanding Dr. Serdukoff's assertion, the rate of uterine involution after pregnancy, at full term, can only be roughly guessed at, for the hand has to measure the womb through abdominal walls of variable degrees of thickness and laxity; but we know positively nothing respecting the rate of uterine involution after abortion, and it would be well if the structure of the uterine walls were examined with the microscope when women die after abortion in our hospitals. From the great frequency of uterine disease after abortion, and from the fact of its being contrary to order that the womb should be called upon to undergo fatty degeneration, unless after pregnancy, at full term, it is presumable that the two facts are related as

cause and effect. Defective involution is probably the reason why one abortion is so often followed by others, the uterine walls refusing to properly expand for the safe guardianship of the foetus, whereas, if the body of the womb be healthy, pregnancy will often proceed satisfactorily, in spite of serious cervical inflammatory lesions. It is, of course, still possible for pregnancy to be brought to a satisfactory issue under the most unfavorable circumstances; for, in a case now under observation, the cervix was extensively torn in a first labour eighteen years ago, and abortion was repeated seven times consecutively. An enlarged body, as well as a considerable amount of cervical enlargement and inflammation, was recognised some years ago by Dr. George Bird, but the treatment he recommended was not carried out. From the symptoms complained of previous to the eighth conception, it is clear that the uterine disease had not abated, and yet this lady went her full time and was safely delivered of a fine boy. During the following four years she did not conceive, long periods of aggravated dysmenorrhœa and menorrhagia being separated by ten days of miserable health. I found the body of the womb about three times its usual size, the cervix similarly enlarged, very hard and sensitive, the os uteri irregularly shaped, and its mucous membrane of a dusky red.

To prevent the defective involution that follows abortion, this should be treated like an acute disease of the womb. The patient should rest in bed, so long as pelvic pains are severe, and warm linseed-meal poultices should be applied to the abdomen. Linseed-tea or poppy-head injections are very useful during the first week, and then injections made by adding a drachm of laudanum and of acetate of lead to a pint of tepid water, twice a day. When the patient resumes her usual mode of life, if there be back pain or bearing-down pains on slight exertion, a vaginal discharge, staining the linen yellow, and debility in spite of tonic treatment, then the patient should be examined, and surgical applications should be made to the ulcerated cervix. Involution is so often defective after abortion because women get about too soon, and too soon resume matrimonial intercourse, and the want of some definite understanding respecting the rules to be adopted after abortion renders it a fertile source of disease. Much of this would be prevented if we could persuade the public that a month's treatment is not too much for an ordinary miscarriage at the third or fourth month, and that a bad miscarriage is worse than a confinement.

It is fair to promise a woman that defective uterine involution, become permanent, may be cured by a subsequent pregnancy. I have seen cases, and others are on record, in which uterine fibroids of considerable size have been softened and swept away by the flood-tide of pelvic circulation that characterises pregnancy and puerperality; so it is easy to understand that tissues, by defective involution long made permanently too hard, may soften, allow of a perfect pregnancy and of the subsequent building up of a new womb after a better model. I have seen instances of this and other cases in which, by a judicious management of puerperality, the womb assumed its proper shape instead of being extensively retroverted, as it had previously been for years.

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# FOUR CONSECUTIVE CASES OF OVARIOTOMY.

By THOMAS WHITESIDE HIME, B.A., M.B., &c.,

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CASE 1.—Mrs. S—, aged thirty-seven, from Kilmarsh, near Chesterfield, married fifteen years, never pregnant. She had always been healthy, and first noticed an increase in her abdomen in 1868. This steadily increased until Sept., 1869, when she was unable to move about, and was tapped by her medical attendant in the country for the first time. She was tapped altogether eight times, as follows:—

|                               |                               |
|-------------------------------|-------------------------------|
| 1st tapping, Sept., 1869.     | Quantity drawn off, 23 pints. |
| 2nd " Oct., 1870.             | " " 25 "                      |
| 3rd " July, 1871.             | " " 29 "                      |
| 4th " March, 1872.            | " " 33 "                      |
| 5th " Nov., 1872.             | " " 34 "                      |
| 6th " Dec., 1873.             | " " 39 "                      |
| 7th " Sept., 1874.            | " " 31 "                      |
| 8th " Oct., 1875. (Operation) | " " 28 "                      |

Total ... 242 pints.

She seemed to have suffered comparatively little from this enormous drawn—over thirty gallons of fluid withdrawn in the space of five years. She was generally up and doing on the third or fourth day. After each tapping her body diminished to its natural size, until after the sixth, when a solid tumour was distinctly felt in the abdomen. After the seventh tapping the tumour had grown to be "as big as her head." She had entered two other hospitals in this town to be operated on, but suddenly changed her mind and left, and she twice acted in the same way in the Women's Hospital.

In appearance she was a small-sized, sallow-complexioned woman, with a marked *facies ovarica*. Owing to the great size of the body she walked with difficulty. Menstruation had always been regular; uterus normal size and movable. Lower part of the thoracic walls greatly bulged outwards by the pressure from below; circumference of abdomen, 44½ in. I examined this patient by the rectum, introducing my whole hand while she was chloroformed. I reached with my finger above the promontory, and could distinctly make out that the left ligamentum latum and the uterus were not complicated in the attachments, though I could not directly feel the attachments on the right side. The patient suffered no inconvenience from the examination.

On May 14th Mr. Baker, F.C.S., Professor of Toxicology in the Medical School, kindly examined two samples of her urine, the first passed at 7 A.M., before breakfast, the second passed at 10.30 A.M., two hours and a half after breakfast. The results were as follows:—

|                        | No. 1. | No. 2.   |
|------------------------|--------|----------|
| Reaction ...           | Acid.  | Neutral. |
| Specific gravity ...   | 1.0262 | 1.0033   |
| Urea per 100 ...       | 2.6    | 0.4      |
| Chloride of Sodium ... | 0.9    | 0.18     |
| Phosphoric acid ...    | 0.051  | 0.0166   |

No. 1 gave an abundant deposit on standing twenty-four hours, No. 2 remained tolerably clear. No albumen existed in either sample.

Operation.—On Oct. 14th ether was adminis-

tered with Richardson's apparatus, one hour being required, and nine ounces of ether used. But, when once narcotised, the effects were most satisfactory. She was once slightly sick. I made an incision in the linea alba only large enough to admit the hand, which I introduced at once for an exploration. Very few adhesions were found, notwithstanding the numerous tapplings. I next drew off about half the contents of the sac, which was of a thin and darkish olive color; then tied the orifice; and, finding it free, withdrew the whole sac. The pedicle was attached to the right ligamentum latum, and was so broad that I had to tie it in four segments. This was done with carbolised gut, and, after separation of the sac, the pedicle was returned to the abdomen. The abdominal wound was closed by deep and superficial ligatures of carbolised gut, and covered with four layers of lint soaked with carbolised oil (one in twenty) and four layers of dry lint. She was then given a suppository (quarter of a grain of hydrochlorate of morphia), her urine was drawn off, and she was put to bed. The operation lasted twenty-five minutes. On the third and fourth days following she was sick several times but this was stopped by a hot turpentine stupe applied over the pit of the stomach. On the 19th I dressed the wound under the carbolic spray; found it all healed beautifully, not more than two drops of pus in the track of one of the thick deep sutures. Several of the superficial (thin) sutures came away, the thicker ones being discolored brown, and a good deal shrunken. On the 19th she had some custard pudding, and enjoyed it. On the 20th the urine became alkaline, thick, sp. gr. 1.022, the quantity in twenty-four hours being twenty ounces. It continued alkaline until the 24th, when it was just faintly acid. The bowels were not moved until the 23rd, when an enema was administered. Several hard scybala had to be removed by the finger from the rectum. On the 29th there was a drop or two more suppuration in the course of one of the stitches. I cut the ligature, as it was a little tight, and it healed quickly. On the evening of the 16th she began to menstruate a little, the discharge continuing for three days slightly. The variations in the urea eliminated and in the temperature were as follows:—

|               | Urea. |       |       | Temperature. |         |  |
|---------------|-------|-------|-------|--------------|---------|--|
|               | Morn. | Even. |       | Morn.        | Even.   |  |
| Oct. 14th ... | .85*  | 1.55† | ..... | 99.3°†       | 101° F. |  |
| " 15th ...    | —     | 4.0   | ..... | 99.2°        | 102°    |  |
| " 16th ...    | 3.2   | 3.9   | ..... | 101.3°       | 101.2°  |  |
| " 17th ...    | —     | 4.2   | ..... | 100.2°       | 101.1°  |  |
| " 18th ...    | —     | 5.4   | ..... | 100°         | 100°    |  |
| " 19th ...    | —     | 2.7   | ..... | 98.2°        | 100.4°  |  |
| " 20th ...    | —     | 4.2   | ..... | 99.1°        | 101.2°  |  |
| " 21st ...    | —     | 3.0   | ..... | 99.3°        | 99.4°   |  |
| " 22nd ...    | —     | 2.9   | ..... | 98.1°        | 99.2°   |  |
| " 24th ...    | —     | 1.9   | ..... | 98.2°        | 98.4°   |  |

\* 10 A.M. before operation. † 10 P.M. ; Before operation.

During the first three days very little food was taken, chiefly milk, with a little ice. I saw the patient a month after she left the hospital, and did not recognise her owing to the great improvement in her condition. She was plump and fat, and greatly changed in appearance.

CASE 2.—Mrs. T—, aged twenty-five, a pale, not unhealthily-looking woman, began to menstruate at sixteen, and had been regular up to the last six months; has been only once pregnant, when she miscarried about the fifth month; mother died of cancer of the womb, aged thirty-five. In 1873

she began to experience severe pain during coition at the site of right ovary, and has suffered severely from it ever since. About a month after the first occurrence of this pain she noticed a small swelling at the seat of pain. The swelling used to diminish after menstruation, but never quite disappeared. After about a year and a half it had grown decidedly much larger, and ceased to diminish monthly. In May, 1875, she first came to me to the Women's Hospital. At that time a tumour about the size of an ordinary cocoa-nut could be distinctly made out, situate in the right iliac fossa, very firm and movable, and not connected with the uterus; the circumference of the body not apparently enlarged; no fluctuation was perceptible. After a short residence she left, and returned on Aug. 6th, 1875. The following measurements were then taken:—

|   | Inches.          |
|---|------------------|
| Circumference over umbilicus ... ..                     | 36 $\frac{1}{2}$ |
| Right anterior superior spine of ilium to umbilicus ... | 7 $\frac{1}{2}$  |
| Left " " " " " "  | 9 $\frac{1}{2}$  |
| Symphysis to umbilicus ... ..                           | 7 $\frac{1}{2}$  |
| Eniform cartilage to ditto ... ..                       | 7-8              |

Her general health was good, but she menstruated weekly to the extent of an ordinary monthly discharge. Abdomen smooth and shining in appearance, slightly acuminate at umbilicus, very tense, dull on percussion all over the front, clear sound in flanks, no alteration of form or sounds on change of position, fluctuation distinct in every direction, no bulging of vaginal walls; uterus three inches long, movable; urine, specific gravity 1018, acid; urea 2·3 per cent.; sodium chloride 0·617 per cent.; abundance of phosphates; no albumen or sugar.

*Operation* (Oct. 28th).—Ether was administered with Dr. Richardson's (Dublin) apparatus, the time thus occupied being nearly one hour, and seven ounces of ether being used. Made an incision in the linea alba about four inches long, between umbilicus and symphysis; on reaching the peritoneum, it projected upwards considerably through the wound, clearly indicating a considerable quantity of ascitic fluid. As the covering membrane was so thin, I considered it useless to attempt to withdraw the fluid with a cannula, which only leads to tearing and waste of time, so I cut through it and at once passed my hand into the abdomen, taking advantage of the presence of the fluid, as in turning, to ascertain the relation of the various parts. There were no adhesions; the pedicle grew from the right ligamentum latum within half an inch of the uterine cornu, and was about an inch and a half long by two inches broad. I then pressed all the fluid out of the abdomen, dried it out with new sponge wrung out of warm carbolic lotion (1 in 60), and as the contents of the sac were too thick to flow through the cannula, I enlarged the incision to six inches, and withdrew the tumour. The pedicle was then tied in two segments with carbolised gut, the ligature cut short, the tumour separated by the *écraseur*, and the pedicle returned to the abdomen. The abdomen was then again carefully cleaned out as before, and the incision closed by deep and superficial sutures of carbolised gut. Four layers of lint soaked in carbolised oil (1 in 20) were then laid over the wound, over this a piece of oil-silk, and a large double layer of lint over this. The whole was then fastened in position by long strips of plaster and a binder. Her water was drawn at once, and half a grain of hydrochlorate of morphia

suppository administered, and she was put to bed. Not a drop of blood was lost during the operation, except a very little from the abdominal incision. Neither bowels nor omentum were seen throughout.

Had slight sickness after the operation for two days, but felt great relief from Chapman's spinal ice-bags. On the 3rd day her urine became alkaline, with severe pain in bladder. I ordered hydrochloric acid, two drachms in an eight-ounce mixture, one ounce to be taken three times daily, and washed the bladder out night and morning with weak solution of carbolie acid. The alkalinity continued for five days. The quantity of urine averaged during these five days about 20 ounces; its specific gravity ran as follows:—1028 (urine alkaline), 1020, 1010, 1018, 1020, 1011 (urine acid). It was highly ammoniacal while alkaline, and the ropy mucous and epithelial débris came away when the bladder was washed out. The wound was for the first time dressed on the third day, under the carbolie spray, when it was found perfectly united throughout; not a particle of pus. On the seventh day after the operation menstruation commenced, and continued normally for three days. Her recovery progressed unimpeded.

Two months afterwards she came to me suffering from ascites, severe pains in vagina, shortness of breath, and inability to get about. The heart's action was very feeble, otherwise there was no apparent derangement. She recovered completely on tincture of perchloride of iron and digitalis.

The course of the temperature after the operation was as follows:—28th: Morning, 99·5° (half an hour before operation); evening, 101·5° (eight hours after operation).—29th: Morning, 100·2°; evening, 100·1°.—30th: Morning, 100°; evening, 100·4°.—31st: Morning, 99·3°; evening, 101°.—Nov. 1st: 101°.—2nd: 99°.—3rd: 99°.—4th: 99·5°.—5th: 99°.—6th: 98·4°.

The urea excreted per 100 varied considerably, even when, as during the first three days, very little food was taken except milk in small quantities. As estimated by Russell and Weet's method, it ran thus:—During three days before operation, on full diet, it was respectively 2·3, 2·1, 2·3.—Nov. 28th: Evening, 1·3 (after operation).—29th: Morning, 2·9: evening, 1·9.—30th: 3·. On Nov. 31st and three following days the urine was alkaline; on Dec. 8th it was acid.

*(To be concluded.)*

## THE FERMENTATION OF URINE, AND THE GERM THEORY.

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CAN bacteria or their germs live in liquor potassæ (Pharm. Brit.) when it is raised to the boiling-point (212° F.)? Such is now the simple issue to which certain great controversies have been reduced. If bacteria germs cannot resist such an exposure, then, by M. Pasteur's own implicit admission, his exclusive germ theory of fermentation must be considered to be overthrown by the

broader physico-chemical theory. The truth or not of M. Pasteur's germ theory is the central question in dispute; but standing on either side, or in close juxta-position, are two dependent subjects of controversy whose importance for biological science and for medicine is even greater.

The question whether living matter can or cannot originate *de novo*, for example, depends upon the answer which is to be given to the question whether bacteria and their germs are or are not killed in boiling liquor potassæ. This also is practically admitted by M. Pasteur in his comments (*Compt. Rend.*, July 17th) upon my recent experimental evidence.

The other subordinate problem, the solution of which depends upon the same issue, is the truth or falsity of an exclusive germ theory in explanation of the origin and spread of the communicable diseases. If the germ theory of fermentation can be proved to be untrue, and if living ferments can be proved to originate spontaneously, we should soon cease to hear much about an exclusive germ theory of disease. This derivative doctrine would not long survive the death of its parents.

Thus M. Pasteur's theory of fermentation, the popular doctrine *omne vivum ex vivo*, and the germ theory of disease, must all be simultaneously overthrown if it cannot be proved by M. Pasteur or some of his followers that bacteria germs are not killed when they are immersed in strong liquor potassæ raised to 212° F. (100° C.) How matters have been brought to this desperate predicament may be explained in a very few words.

Since the year 1862 M. Pasteur has defended four main positions, on the strength of which he has based his germ theory of fermentation, his repudiation of "spontaneous generation," and his support to the germ theory of disease. In the year 1870 and subsequently I have many times submitted these four positions to an independent criticism by means of experiment, and the result has been a confirmation of two of them and a rejection of the remaining two—the rejection being necessitated rather on account of facts obtained by new methods than from any implied defect in the particular range of experiments from which so distinguished an investigator as M. Pasteur deduced his opinions. Our respective views on these four points may be thus tabulated:—

#### PASTEUR.

1. That *some* boiled organic infusions having a neutral or slightly alkaline reaction will not remain pure even when protected from contamination. They will, on the contrary, ferment and swarm with bacteria.

2. That all bacteria and their germs are *not* killed in such neutral or slightly alkaline fluids raised to 212° F. (100° C.)

3. That *all* boiled organic infusions having an acid reaction will, when protected from

#### BASTIAN.

1. Ditto.

2. That all bacteria and their germs *are* killed in such neutral or slightly alkaline fluids raised to 212° F. (100° C.)

3. That *some* boiled organic infusions having an acid reaction will, when protected from

contamination, invariably remain pure.

4. That all bacteria and their germs are killed in such boiled acid fluids.

Omitting for the present all intermediate stages of the controversy which has now been carried on for several years between one or other of M. Pasteur's followers and myself, I will proceed to show how the questions between us have been affected by my latest researches.

The results obtained in these researches have been embodied in a memoir communicated to the Royal Society on June 15th, of which an abstract was published in *Nature* on July 6th. A very short "Note" on the subject of these researches was also submitted to the Académie des Sciences on July 10th, and subsequently published in the number of the *Comptes Rendus* bearing that date. M. Pasteur replied to this note at the next meeting of the Academy (*Compt. Rend.*, July 17th), at a time when he would appear not to have seen the fuller abstract of my researches published in *Nature*. This will account for an error into which he seems to have fallen in regard to one of the most important conditions prescribed for some of my experiments, to which I shall have occasion presently to refer.

As regards the frequent fertility of boiled organic fluids having a neutral or faintly alkaline reaction (No. 1), it will be seen that M. Pasteur and myself are thoroughly agreed, notwithstanding Professor Tyndall's representations to the contrary. M. Pasteur now says (*Comptes Rendus*, July 17th, p. 178): "Je m'empresse de déclarer que les expériences de M. le Dr. Bastian sont, en effet, très exactes; elles donnent, *le plus souvent*, les résultats qu'il indique..... Il n'y a donc, entre M. Bastian et moi, qu'une différence dans l'interprétation d'expériences qui nous sont maintenant communes." The difference of interpretation to which M. Pasteur alludes depends upon our difference of view in regard to position No. 2. It was specially with the hope of dissipating any doubt remaining upon this part of the question that one section of my new experiments was undertaken. I determined to submit M. Pasteur's interpretation to the test of direct experiments, conducted in a way likely to yield decisive results. This is the point principally referred to in my "Note" to the Academy, and upon which M. Pasteur dwells in the above-mentioned communication.

If the fertility of the boiled neutralised fluids or infusions were really due to the survival of germs, as M. Pasteur supposes, then the boiling of the fluid in its acid state (when its germs would by admission be destroyed), and the subsequent addition to it of a sufficient amount of boiled liquor potassæ, without extraneous contamination, should be attended by negative results—that is, the fluid should remain pure, according to M. Pasteur, if it were really germless. But numerous experiments performed in this manner have shown me that sterilised urine to which boiled liquor potassæ in proper quantity is added will ferment and swarm with bacteria in a few days, and all the more quickly if the experimental vessels and their fluids

contamination, ferment and swarm with bacteria.

4. Ditto.

are maintained at the temperature of 122° F. (50° C.)

M. Pasteur, whilst admitting the facts, says that this addition of boiled liquor potassæ to sterilised urine causes the mixture to ferment, because such added liquor potassæ contains germs which were not killed when this fluid was raised to 212° F. (100° C.) This, truly, is an astounding hypothesis. It is an hypothesis, however, which had been already anticipated and rejected, as anyone may see by referring to the concluding portion of my abstract, as published in *Nature*.

The answer, though simple, is twofold.

*First:* If boiled liquor potassæ were a germ-containing medium, then one or two drops of it (as of other germ-containing media) would always be capable of contaminating many ounces or even a gallon or more of sterilised acid urine. This, however, is never the case. The boiled liquor potassæ is only capable of initiating fermentative changes and of leading to the appearance of bacteria when it is added in quantities strictly regulated by the quantity and degree of acidity of the specimens of urine with which the experiment is being made. *Second:* A very slight excess of liquor potassæ over and above the quantity needed for exact neutralisation almost always yields negative results. This is also quite irreconcilable with M. Pasteur's view, that the liquor potassæ acts as a fertilising agent in my experiments by reason of its containing certain germs which have survived a heat of 212° F.

A procedure of this latter kind (namely, the addition of an excess of liquor potassæ), unwittingly adopted by M. Pasteur, because he was not forewarned, was in all probability the reason of his obtaining negative results when he operated with solid potash raised to 110° C. or higher. M. Pasteur says (*loc. cit.*, p. 179), the potash was dropped into the urine in quantity sufficient to render it "alkaline." The negative results obtained in these trials he attributed to the fact that the potash had been heated to 230° F. (110° C.), whilst I feel certain that they were rather due to the addition of an excess of potash, seeing that the addition, as he himself says, rendered the fluid "alkaline."

Briefly, then, M. Pasteur admits me to be correct in stating that boiled liquor potassæ in proper quantity will fertilise sterilised urine, and I prove that his interpretation of this fact is wrong by referring him to the totally different effects which result from the addition of one or two drops, or of a slight excess of boiled liquor potassæ. The negative effects in these cases are wholly irreconcilable with the notion that living germs are capable of surviving after they have been boiled in strong liquor potassæ; and if this is the case, M. Pasteur's position No. 2 is discredited, and my experiments with neutralised urine suffice to upset his exclusive germ theory of fermentation and to establish the fact of the *de novo* origin of bacteria.

But this same end may also be achieved in another independent way.

Another of the most notable results of my recent work is this. I have ascertained that a moderately acid urine will, after it has been boiled, remain pure when kept (free from contamination) at a temperature of 77°—86° F. (25°—30° C.), though the same specimen of "sterilised" urine will ferment and swarm with bacteria in less than three days if it is maintained at the higher temperature

of 122° F. (50° C.) Many acid vegetal infusions will behave in precisely the same manner. But M. Pasteur still declares that bacteria and their germs are killed in acid fluids raised to 212° F. (100° C.) His words are (*Compt. Rend.*, July 17th, p. 179): "*J'ai prouvé directement qu'ils périssent dans un milieu acide à 100 degrés.*"

Here, then, is a ready means by which any careful experimenter may ascertain whether M. Pasteur is not wrong in maintaining his proposition No. 3. And if this is the case, if the germless fluid can (without extraneous contamination) ferment and swarm with bacteria, there is nothing for M. Pasteur to do but renounce his exclusive germ theory of fermentation, and to adopt the belief that bacteria may arise *de novo*.

Queen Anne-street, W.

## NOTES

ON

### SOME PATHOLOGICAL FEATURES OF STRANGULATED HERNIA,

ESPECIALLY WITH REFERENCE TO THE CAUSE DEATH, AND TO AN EXPLANATION OF SO-CALLED STRANGULATED OMENTUM.

By RUSHTON PARKER, F.R.C.S., M.B.,

Pathologist to the Royal Infirmary, Surgeon to the Stanley Hospital, Liverpool.

A REVIEW of some of the cases of patients who have died after strangulated hernia, in which I have examined the post-mortem appearances, and of other cases which I have recently seen, brings with it an answer, more or less satisfactory, to the following questions:—1. Are the anatomical appearances adequate to account for persistence of the symptoms of strangulation, and so for death? and if so, what explanation must be placed upon them? 2. Is strangulated omentum alone, as such, to be accepted as a form of strangulated hernia?

Three of these cases have occurred in the Liverpool Infirmary; two I have had access to in the practice of other professional friends in the town. To all these gentlemen I am indebted for permission to make use of their materials. The only case that recovered was one of the last two, and is introduced here as illustrating a point to which another case pointedly alludes. A sixth case occurred in my own hospital practice.

**CASE 1.**—A man, aged thirty-nine, with left inguinal and scrotal hernia of thirty years' standing, formerly all reducible, latterly not. On Nov. 9th strangulation, reduction in infirmary by taxis after twelve hours; omentum left in sac; uncertainty whether any bowel yet remained. Symptoms returned. Herniotomy by Mr. Harrison after two days, sac being opened; no gut found; much omentum reduced; some left in sac fixed by fibrous adhesions. Death in thirty-six hours. The post mortem examination revealed sticky peritonitis; transverse colon dragged tightly down to the level of the umbilicus by omentum; above this point intestines distended, below contracted; bit of ileum near lower end, showing where it had been strangu-

lated, dark purple, probably recoverable, lying near internal ring.

CASE 2.—A man, aged sixty-four, with a left inguinal hernia of a few weeks' standing, strangulated a couple of days. Herniotomy, at the infirmary, by Mr. Harrison; sac not opened, and the bowel reduced by simply holding up the sac, the neck of which had been bent on itself. There was no stricture. Symptoms returned in twenty-four hours, and death took place in four days. The post-mortem examination revealed sticky peritonitis and moderate distension above the piece of ileum which had been implicated, and which was eight feet from lower end; the end of the omentum was lying loosely in the sac, and was easily withdrawn. No narrowness of sac's neck.

Why did these cases die? All direct cause of strangulation had been removed, but what maintained the symptoms? It would seem that the injured bowel, becoming adherent by peritoneal lymph to the adjacent wall or viscus, and its muscular coat having become paralysed above the strangulated portion, an amount of obstruction was effected which would, under ordinary circumstances, be impracticable. Mr. Bryant\* refers to a case which, in several points, resembles Case 1, and in which obstruction of the transverse colon and symptoms of strangulation were kept up by adhesion and traction of omentum. I am disposed to regard the very slightest adhesion and folding of a previously strangulated bowel as capable of effecting fatal obstruction when combined with paralysis of the muscular coat above. This last feature is referred to by Sir James Paget in his *Clinical Lectures*, 1872. This is also the explanation I have to offer in the following unsuccessful instance.

CASE 3.—In March, 1875, a woman, aged fifty-five, was admitted into the Stanley Hospital, suffering from a right femoral hernia of four days' duration, during which time she had suffered from symptoms of strangulation. I performed herniotomy at once, and opened the sac, which contained a small spherical piece of ileum, only part of the circumference of the gut. The bowel was severely nipped and furrowed, and had a white patch on it, but was returned. The symptoms never abated, and death took place in about thirty-six hours. The post-mortem examination revealed sticky peritonitis, the injured piece of gut adhering to abdominal wall near the crural ring; bowel distended above, contracted below this point. Here, too, though the symptoms persisted, no actual strangulation remained, but obstruction was nevertheless, I believe, kept up by the adhesion of the injured bowel in a folded state, aided by the paralysis of the bowel above.

In each of these cases, though strangulation was removed, still obstruction remained—an amount of obstruction which would probably be imperative in the case of an uninjured bowel.

Another feature of Case 1 attracts attention. If this case had recovered, it might have been described, with some show of reason, as a case of "strangulated omental hernia." It was noticed that at the post-mortem examination the bowel was distended as far as the middle of the transverse colon, which was dragged down by the colon engaged in the inguinal canal and scrotum and by that loosely adherent to the neighborhood of the

internal ring. But there had certainly in this hernia been a piece of ileum which was reduced by taxis; the redundant omentum was reduced at the herniotomy, and both took up a position close to the internal ring. By this time, however, no doubt the distended bowel was paralysed; before it could recover its power, the omentum was firmly enough adherent below to keep up its slight drag on the colon; hence the continuance of the obstruction.

In reference to the supposed strangulated omental hernia, let me here quote a passage out of Lawrence on Ruptures, fifth edition, p. 454: "If strangulation of the omentum by the ring is sufficient to produce dangerous and mortal consequences, must they not be equally expected from that stricture which is caused by the ligature?" Here the ligature of the omentum is condemned on the supposition—a most reasonable one—that strangulation must be a consequence. But has not ligature of the omentum been over and over again practised without harm?

In "Surgery, its Principles and Practice," by Mr. Holmes, 1875, p. 586, I read: "The strangulation, even of the omentum only, produces symptoms identical in kind with those of strangulated bowel, though possibly not so severe—a fact which I find it difficult to account for on purely mechanical principles, especially as the omentum, when exposed in the operation for hernia, is constantly tied tightly, in order to remove portions of it, with complete impunity." This is the only reference I have yet found to the difficulty of accepting this manifest contradiction, which by many writers on hernia is received as a fact in confident terms. I suppose that the real fact is that strangulated omentum may indirectly produce symptoms of strangulated intestine, in consequence of dragging; but I imagine that, apart from its connexion with intestine, and the possible consequences of that connexion, mere strangulation of omentum, *per se*, not only cannot exist, but, as a proposition, must be looked upon as unthinkable.

CASE 4.—In this case the man died six months after reduction of an inguinal hernia by taxis in the infirmary, having suffered the whole time from pain in the bowels, obstruction, diarrhoea, &c. At the post-mortem examination the injured piece of ileum was found narrowed and tortuous, all the intestines above being much thickened and dilated. The sigmoid flexure was, moreover, adherent to this coil and to the bladder, and was burst besides just above the attachment to the bladder. Here had been obstruction at the former seat of strangulation, consequent hypertrophy of bowel, adhesion below, and a second obstruction of this bowel (by dragging), and then rupture. He was attended by my friend, Dr. Adam, who gave me the opportunity of seeing the case after death. This case seems to illustrate the obstructive effects of adhesion and traction to a singular degree.

In the two following cases the strangulation was kept up by acute flexure of the coil of gut round the corner of the sac's neck.

CASE 5.—Herniotomy by Mr. Bickersteth after sixty-four hours' strangulation of an old congenital inguinal hernia. Strangulation removed. Hernia displaced through neck of sac into iliac fossa; bursting of intestine and extravasation of faeces into subperitoneal tissue of side of abdomen. The gut was here folded acutely, and the coil adherent to itself in its lesser curve.

\* Surgery, pp. 332, 333.

CASE 6 occurred in the practice of Mr. H. O. Thomas, and when I saw it, the patient, aged nineteen, had had hernia on the right side for eleven days, strangulation two days. He was collapsed, vomiting fæces, almost pulseless, with abdomen tense, and, with each vomit, fæces welled out of the hernial tumour, through the puncture of an aspirator. Mr. Thomas opened the sac, the hole in the bowel was pinched up in artery forceps and tied with carbolised catgut, as were also several bleeding points where adhesions had been torn. There was no stricture in the sac, and the gut, now it was free, was easily put back. The patient quickly recovered. The cause of the hernia was the invagination held out by an undescended testicle in the groin.

We here see grounds for obstruction and all the symptoms of strangulation, although in one case the nipping of the gut had ceased, and in the other had never existed.

A word as to the cause of death in these cases. It seems to have been due immediately to "exhaustion," in one or two with "collapse" supervening. The exhaustion may be the result of pain and the general distress which the symptoms lead to. But "peritonitis," "artificial anus," "fæcal extravasation," "reduction *en masse*," though often assigned as causes of death, are, most of them, and probably all at times, compatible with recovery, and can never really be called causes of death. They produce exhaustion, which, probably more than anything else, immediately leads to a fatal issue.

Liverpool.

## ON THE SUPPOSED RELATION BETWEEN HÆMORRHAGE AND ALTERED BAROMETRIC PRESSURE,

WITH OBSERVATIONS ON 120 CASES OF HÆMOPTYSIS.

By JAMES M. WILLIAMSON, M.D. Edin.,

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for Consumption and Diseases of the Chest,  
Ventnor, Isle of Wight.

THOSE who have advanced and supported the theory that variations in atmospheric pressure are constantly exercising a determining influence on the occurrence of hæmorrhages, have told us that bleedings may be determined either by an increased or a diminished amount of pressure. They argue that when the barometer is high, especially if the air at the same time is cold, the activity of the circulation is augmented, particularly through the viscera; but, on the other hand, when the barometric column is low, and more especially if this diminished pressure is accompanied by much heat or moisture of the air, the blood-current is slower, and a state of passive congestion is encouraged. We are all aware that undue acceleration or retardation of the circulation is a state full of danger to the bloodvessels when their coats are weakened, as in some forms of disease; and these conditions of the blood-current are capable of being occasioned, we are assured, by the oscillations in the pressure of the atmosphere. A more recent advocate of the theory has perhaps advanced a step further, and has informed us that active or

sthenic hæmorrhages which terminate fatally are the result of, or are at all events attended by, an elevated condition of the mercurial column, while passive and symptomatic hæmorrhages are associated with an opposite condition of the barometer.

It is a fact well known that remarkable disorders of the circulatory system have been experienced by those who have voluntarily exposed themselves to great variations of atmospheric pressure, as in the ascent of very high mountains, and in the case of divers. The symptoms of *soroche*, or mountain sickness, which have been described by Humboldt, Bonelli, and other travellers, vary in severity according to the height attained. Mr. C. R. Markham mentions that having reached an altitude of 14,350 feet when travelling in Peru, he suffered from a "violent pressure on the head, accompanied by acute pain and aches in the back of the neck, causing great discomfort." Actual bleedings do not seem to occur till a greater elevation than this is attained; and even then, according to Dr. Walshe, the possibility suggests itself that where hæmoptysis results latent disease may have already existed in the lungs, heart, or great vessels. There can be no doubt, however, that these facts strongly aided, if indeed they did not wholly originate, the theory that smaller variations in pressure exercise an influence on the outbursts of hæmorrhages, at all events in those with fragile vessels. Now, at a height of 14,850 feet, an elevation not great enough, as has just been said, to produce an actual bleeding, the barometer would have fallen thirteen inches, and would only stand at 17.9. But the limits within which the ordinary barometric column oscillates do not exceed four inches for extreme range, and the usual range is confined to about two inches. We have nothing to do at present with the discussion whether the action of changes of atmospheric pressure on living bodies is mechanical or chemical, although one would have supposed that the notion revived by M. Bert\* had been set aside some time ago by the observations of Payerne, quoted by Dr. Walshe. What we desire to know is whether it is a fact that these smaller variations in pressure exert any determining influence on the occurrence of hæmorrhages. The lungs are perhaps better adapted than any other region of the body for the study of this supposed atmospheric influence. The amount of blood in relation to the structure in which it circulates is greater in them than in any other part of the body, with the exception of the bloodvessels themselves; while, again, they present a large area constantly exposed to atmospheric changes. It is not to be wondered at therefore that the statistics which have been hitherto published on the subject, although including cerebral and uterine hæmorrhages, have to a great extent been made up of cases of hæmoptysis.

I propose now to lay before the reader the results of my own experience on this subject, founded upon the careful observation of 120 cases of pulmonary hæmorrhage which have come under treatment at various periods during the last three years. The patients were all suffering from phthisis, and as they were all inmates of the Royal National Hospital for Consumption at Ventnor, there was, in addition to the accuracy of the medical record of each case being ensured, the advantage of having a number of persons placed

\* Comptes Rendus de l'Académie des Sciences, Dec. 27th, 1875.

at the same time under identical conditions. The readings were taken from one of Negretti and Zambra's standard barometers, fixed in one of the blocks of houses of which the hospital consists.

For the sake of convenience I have divided the cases into four classes, arranging them according to the actual amount of blood lost—namely, into small, considerable, copious, and profuse.

1. *Small*.—This class includes all of the cases in which the amount of the hæmorrhage was under one fluid ounce, and it comprises 80 out of the 120 cases. Of the 80 bleedings, 86 occurred when the barometer was rising, and 44 when it was falling. The exact amount of rise varied from .002 in. to .40 in.; and of fall, from .015 in. to .461 in.

2. *Considerable*.—Under this head are classed 16 cases in which the amount of blood was estimated at above one and under three fluid ounces. Of these, 11 happened when the mercury was going up, the lowest amount of rise being .002 in. and the highest .403. The barometer was falling when the remaining 5 occurred, the least fall being .036 in. and the greatest .196 in.

3. *Copious*.—This subdivision comprises 12 cases in which the hæmorrhage was to the extent of from three to six ounces. Two-thirds occurred with a rising barometer, the extremes being .018 in. and .170 in. The mercury was falling when the remaining 4 took place, the extremes being .083 in. and .429 in.

4. *Profuse*.—A class comprehending the 12 cases in which the hæmorrhage exceeded six fluid ounces. Of these 12, the barometer was stationary in 1, rising in 6, falling in 5. In 2 of these profuse cases the bleeding was so violent as to be fatal in less than ten minutes from its outburst; the mercury was stationary when one of these occurred, while on the day on which the other happened there was a rise of .727 in.

Looking at the 120 cases collectively, it will be seen that 50 took place when the glass was falling, 69 when it was going up, and 1 when it was stationary. These data are very far from confirming Dr. Joslin's statement made in an American journal, and founded on notes of 54 cases of hæmorrhage—namely, that "the probability that the atmospheric pressure shall be diminishing rather than increasing at the time of the attack is about 2 to 1." And yet, on the other hand, so far as they go, they do not contradict the theory which conveniently connects a bleeding with either a rising or a falling barometer.

But some other facts which were observed in the course of the investigation remain to be mentioned. First, it was noted that during the entire period of the three years the barometer remained stationary for twenty-four hours together only on seven occasions. The chances, therefore, of a bleeding, or, indeed, of anything else occurring on a day on which the mercury was neither falling nor rising was extremely small. Then, again, it was observed that a patient who had hæmorrhage coincidently with a certain fall or rise in the mercurial column had no return of the bleeding on another day when there was an equal or even a much greater variation in pressure. Can it, for instance, be supposed that a rise of 1-50th of an inch in the barometer will determine a profuse hæmoptysis at one time, whereas at another a rise of nearly an inch passes by without any untoward circumstance? It was also noted that numerous falls and rises occurred when there were no hæmor-

rhages at all, although these variations were to a greater extent than when the same or other patients had had hæmoptysis. Lastly, if the theory is true, it is difficult to see why, when numbers of phthisical patients are congregated together in a large hospital, more cases of hæmoptysis do not occur at one and the same time, especially when it is remembered that expectoration of blood takes place to a greater or less extent in at least 80 per cent. of cases of phthisis.

Taking these facts into consideration, then, as well as the collateral records of hæmorrhages and barometric readings, it cannot be said that observation confirms the notion that variations in atmospheric pressure have a determining influence on the outburst of pulmonary hæmorrhages. I find that this conclusion agrees with that drawn by Dr. Arthur Ransome from his investigations;\* and these results may be offered in response to an appeal made in a paper read before the Leeds meeting of the British Association, for careful observations "either to confirm the theory or to prove it a philosophical figment unworthy of further investigation."

Welbeck-street, W.

## CASE OF COLOTOMY.

By HARRY A. DE LAUTOUR, M.R.C.S. Eng.

THE following case of colotomy (Amussat's operation), performed on account of cancer of the rectum, has been under my care.

D. K—, aged thirty-seven, a storekeeper at the Maerswhemia gold diggings, had been fourteen years in the colonies as a shepherd and miner. He had always enjoyed good health until the last two years. Father and mother both alive and in good health. An aunt died of cancer. Two years ago the patient was taken ill with an attack said to be dysentery. Was under treatment, and improved for a short time. Since then he had been gradually getting worse. He complained of great pain in the lower part of the back and abdomen, had excruciating pain on passing motions, which had become very small and hard, like pipe-stems. He passed also a quantity of offensive slimy discharge. Had lost flesh lately. The pain was worse at night, and he had been in the habit of injecting large quantities of laudanum per rectum. Lately he had been in great terror of having his bowels opened, and retained his fæces until pain induced him to take castor oil. This he did about three times a fortnight.

On examination he appeared to be considerably older than his stated age, was thin, and had the peculiar cachexia accompanying cancerous cases. The abdomen was thin and flattened, and the descending and transverse colon could be felt filled with hardened fæces. Digital examination per rectum caused great pain, not at the anus, but about two inches higher up, where the finger came in contact with hard masses of cancerous growths; the discharge was extremely offensive. No opening could be detected through the cancer, but, owing to the pain, no further examination was made. He implored me to do something to re-

\* Proceedings of Lit. and Phil. Society, Manchester, 1861.



lieve him from the great agony he suffered when passing his motions, and even suggested that an opening should be made in his side, and placed his hand over the left ilium. He assured me no one had ever suggested this to him before, and I was very much struck at this strange appeal of Nature asking for relief and pointing herself to the most appropriate spot for such relief. I told him that such an opening could be made; pointed out the risks of the operation and the disagreeable consequences, and added that I did not feel justified at present in operating upon him.

On Dec. 28th I received a letter from him, requesting me to come up and operate upon him, as he feared that his bowels were totally obstructed. On arrival at the diggings, some forty miles away, next day, I found him strong enough to walk about. He had passed nothing for six days, and was afraid to take castor oil. Finding him strong enough to travel, I persuaded him to come down to town, which he accordingly did on the 31st. He was in great pain, and had not passed any motions; the transverse and descending colon were filled with hardened feces. Countenance anxious; no hicough; no tympanites. Pulse 74.

With the assistance of Mr. A. A. Fleming, of Oamaru, who administered chloroform, and Mr. C. E. Smith, of Otepopo, I proceeded to perform colotomy on January 2nd, 1876. A transverse incision was made from the outer border of the erector spinæ, about five inches long, parallel to the crest of the ilium, and about one inch from that bone. The skin, superficial fascia, and abdominal muscles were carefully divided until the transversalis fascia was arrived at; the dissection was then continued until a few fibres of the quadratus lumborum were seen in the centre of the wound. The deep layers of the fascia were then carefully divided for about an inch and a half, and a quantity of fat enclosed in fascia was then exposed. This rose and fell with the breathing. It was suggested that the small intestine had been exposed. On examination with the finger, the colon could be felt containing hard feces and lying more behind the quadratus lumborum. The dissection was continued, and on dividing the fascia it was found that, instead of small intestine, it was merely the fat surrounding the colon. This was then exposed, and a *nævus* needle, armed with a strong waxed silk thread, passed through it; it was then drawn up to the surface, and stitched to the upper and lower margins of the wound. The gut was then opened freely. There was no escape of feces or of feculent matter. Hard scybala could be felt with the finger both in the descending and transverse colon. The cut margins of the colon were stitched to the edges of the wound with six catgut sutures, the wound sponged with a solution of chloride of zinc, and then brought together with deep and superficial sutures, and dressed with dry lint and cotton-wool. A morphia suppository, one-third of a grain, had been previously inserted into the wounded gut. Five hours later he was suffering slightly from shock; skin hot and dry; abdomen painful and tympanitic. Bandages were loosened; two drachms of laudanum injected per rectum, and hot fomentations with laudanum applied to the abdomen.

Jan. 3rd.—Doing well. Skin moist and cool; abdomen flaccid; pulse 84. Feels much relieved. Had previously suffered from flatus, which, by pressure on the rectum, had caused much pain.

He finds now that this escapes through the wound. He has not passed any motions. During the day he has taken six drachms of laudanum per rectum; the pupils are not contracted, and are sensitive to light. Ordered two drachms of tincture of opium every four hours as an injection.

4th.—Continuing well. The wound on each side of the gut appears to be uniting by first intention. Has passed no motions as yet. There are no signs of peritonitis.

6th.—The silk ligatures attaching the gut to the margins of the wound, and also the sutures of the wound, were removed; everything looking healthy.

8th.—The wound at the ends have united perfectly; the gut is also adherent to the edges of the wound, but that part of the wound adjoining the gut has burst open, and does not look healthy. Poultices applied instead of the dry lint. Has not passed any motions as yet, neither per rectum nor through the artificial anus. The colon above and below the wound can be felt filled with hardened feces, and they can also be felt with the finger introduced through the artificial anus. He feels in capital health, and takes food more freely than he has done for some weeks past. To-day he got up and walked about his room with ease and comfort.

10th.—No motions have as yet come away. It appeared to me that the feces below the wound compressed the gut above the wound, and acted as a mechanical obstruction, and that if I could get the contents of the colon below the wound away the contents above would naturally come through the artificial anus. I therefore ordered an enema of castor oil per rectum and one drachm of tincture of opium by the mouth, with a view of lulling the pain during the passage of the feces.

11th.—Has passed a quantity of feces per rectum, and shortly afterwards several hardened lumps of feces, said to be the size of a hen's egg, came through the artificial anus. Ordered a tablespoonful of confection of senna by the mouth.

12th.—A large quantity of soft and pasty feces has come away through the artificial anus during the last twelve hours. The wound is looking healthy, and is now dressed with an astringent lotion. He gets up every day for a few hours, and feels in good health and spirits. The catgut sutures were removed to-day, and appear to be in the same condition as when inserted—that is, they do not appear to have been absorbed to any appreciable extent. They have not caused any irritation or suppuration, and have proved very valuable in keeping the gut in its place until firm adhesion has taken place.

17th.—Improving in every respect; passes motions regularly through the artificial anus. As he does not suffer as much pain as formerly, he takes less opium. His appetite is good; he takes outdoor exercise, and looks forward to returning home in the course of two or three days.

I have ventured to send this case for publication in *THE LANCET*; for although colotomy has of late years been not infrequently performed, yet, seeing how slight the after-consequences of this operation, as proved by Amussat, may be, and seeing also the beneficial results and relief afforded to the poor sufferers, for a short time only though it may be, colotomy seems to obtain hardly so much favor as it deserves.

There are two or three points of interest in this case. First, that no motions were passed for

nineteen days, from December 23rd until January 11th, and that, too, without vomiting or any other alarming symptoms. Naturally the intestine would suffer from shock, which would tend to paralyse its action for a time. Secondly, that the fact of the patient being in the habit of taking enormous doses of opium—an ounce of laudanum in twenty-four hours, as he had frequently done—had no bad effects on the result of the operation; possibly it may have had a tendency to lessen the chances of peritonitis. Thirdly, that the fat enclosing the colon rises and falls with expiration and inspiration, which is said by some to be peculiar to the small intestine. Fourthly, the great assistance rendered by the catgut sutures, which were taken from an old fishing-cast, and were not carbolised, and that they were not absorbed, though I do not deny that eventually they might have been. Fifthly, that the contents of the lower colon caused obstruction to the passage of the *fæces* contained in the gut above the artificial anus, and that by their removal a free exit was at once given, and that then the intestines performed their functions in a natural manner.

Otago, New Zealand.

#### ON THE ACTION OF HYOSCYAMINE AND ITS RESEMBLANCE TO ATROPINE.

By J. SYDNEY PEARSE, M.R.C.S., L.R.C.P., Lond.,

Physician's Assistant, University College Hospital.

THESE investigations have been made with the crystalline hyoscyamine, imported from Germany and prepared for use by Mr. Martindale, of New Cavendish-street. The strength of the solution was one grain in two drachms, similar to the liq. atropiæ of the Pharmacopœia.

Its external application to the skin appears to have a similar action to atropia in relieving pain. I have seen this in two instances. In one a hysterical woman had complained of neuralgic pains in the temporal region for two days without any apparent cause. A few drops of the solution were painted over the painful spot, and in half an hour the pain had almost entirely disappeared. It produced no redness of the skin, and, as far as could be judged, no anæsthesia. The skin was dry before the application, so that the action of the secreting glands could not be said to be checked. The other instance was on a patient suffering from pleurodynia, in which the pain was removed, but not to the extent of the other case. The application, however, was not repeated more than once.

The solution, when painted into the skin in the neighborhood of the eye, does not appear to produce any topical action on the pupil, there being no dilatation, and no alteration of vision. If this be true it will differ from atropia in this respect. When dropped on the conjunctiva its action is evidently very similar to atropia. The dilatation is, perhaps, not quite so rapid as when caused by atropine, but the amount of contraction of iris is quite as great, and the effects last equally long, if not longer. The amount used in each observation was about 1-240 grain, and probably some of this escaped. Its application does not cause any un-

easiness, and it was on one occasion noticed to relieve pain in the eye immediately on introduction, and before the pupil commenced to dilate. As soon as the topical action commenced misty vision was frequently complained of, which lasted from a few hours to four days. This was present in about half the cases, and varied from a slight dimness to an extent which rendered it impossible for the patient to read unless the print was within two or three inches of the nose.

The time required to produce full dilatation was found to be about fifteen minutes; the longest being twenty-five minutes, and the shortest ten minutes. In no instance did it fail to produce its results; and in the majority of the cases the dilatation was extreme, the iris being reduced simply to a narrow line. No diplopia was produced. There was total insensibility of the iris, lasting a variable time; the duration of dilatation also varied, lasting from two to twenty-one days. The following table shows the average:

| No.   | Time for full dilatation. | Duration of dilatation. | Pupils react fairly well. | Affection of sight.                    |
|-------|---------------------------|-------------------------|---------------------------|--|
| 1 ... | 13 min.                   | ... 5 days              | ... 4 days                | ... {Dim vision, lasting till 4th day. |
| 2 ... | 15 min.                   | ... 6 days              | ... 4 days                | ... {Vision good throughout            |
| 3 ... | 17 min.                   | ... 10 days             | ... 2 days                | ... {Slight dimness of vision.         |
| 4 ... | 15 min.                   | ... 12 days             | ... 36 hours              | ... {No alteration of vision.          |

In no instance was sufficient applied to produce dilatation of the opposite pupil, or other constitutional effects.

When used hypodermically, the results produced by hyoscyamine are very similar to those of atropine. The dose, however, must be somewhat larger to produce the same effect as atropia. Dr. Ringer finds that "in profuse sweating, produced by the hot chamber of the Turkish bath, 1-100 gr. or 1-200 gr. of atropia will in a few seconds completely dry the skin and keep it dry, and that the same dose would arrest the sweating of phthisis." One minim of the solution, containing 1-120 gr. of hyoscyamine, was injected hypodermically in a man suffering from phthisis, perspiring profusely. No effects were produced except a little dryness of the mouth, and of this there could be no absolute certainty. If, however, the dose be doubled, and one-sixtieth of a grain be given, the symptoms produced are constant and well marked. Like those caused by atropia, they are—dryness of the skin, mouth, and pharynx; great thirst; flushing of the face; injection of conjunctiva, dilatation of the pupil, and loss of power of accommodation of the eye; pulse increased in frequency, the fullness being also increased. There is also headache, giddiness passing on to a semiconscious condition and sleep.

The dryness of the mouth and pharynx were invariably present, coming on usually within half an hour of the injection. The skin in some instances became hot as well as dry, and a rise in the temperature to the extent of 1° in an hour was noted where the full constitutional effects were produced. The mouth became dry, thirst being great, but in no instance was this stage succeeded by difficulty in swallowing and hoarseness, nor was the dryness replaced by a viscid, sticky, foul-smelling secretion, as found by Dr. Harley with

atropia. The flushing of the face and injection of conjunctiva were well marked, the pulsation of the carotids being increased and visible on the surface in a few observations; but the pulsation of the carotids and injection of the conjunctiva were frequently absent, although the face was almost always flushed. Dilatation of pupil was very obvious, and usually present. Generally speaking, the dilatation was not so great as that due to local application, nor were the effects so permanent, the iris having recovered itself within twelve hours. The power of reacting to light was also lost, there being misty vision and loss of accommodation, usually followed by sleep. The pulse was increased in frequency, the increase, however, not being so great as is caused by atropia: the greatest rise noticed with hyoscyamine was 38 pulsations per minute, whereas with atropia 50 or 60 beats per minute above normal have been recorded. The average of ten observations with hyoscyamine (one-sixteenth of a grain each) gave an increase of 18, but it was found by increasing the dose that there was a corresponding increase of pulse: for instance, 1-120 gr. caused an increase of only 8 beats, 1-60 gr. an increase of about 18, and 1-40 gr. an increase of 36. The increase commenced within five minutes of the injection, and had reached its point of maximum intensity in about half an hour. This increase generally lasted less than an hour, and the frequency of pulse had fallen to its normal condition in three or four hours. It was not noticed to have fallen below the normal average, although it lost in strength as the heart's action became slower. No irregularity of the heart was observed.

The headache, giddiness, and tendency to sleep were induced in the majority of instances, but where the headache was very severe this prevented sleep. The mind was not affected, and there was no delirium.

Atropia is said to produce unsteadiness of gait. This was not noticed except in a patient with locomotor ataxy, in whom the ataxic condition was greatly intensified when under the influence of this drug. He suffered acute shooting pains in the affected limbs, which were at all times considerably relieved by the hyoscyamine. It never caused inflammation at the place of administration.

*Effects on the urine.*—In comparing the action of hyoscyamine with that of atropia, the results do not appear to be similar; for it has been pointed out that atropia increases the quantity of the urinary water, whereas hyoscyamine, as far as these observations show, does not affect the secretory power of the kidneys, or, if it has any action, tends to lessen the urine. In estimating the amount of urine secreted, the patients emptied their bladders every hour for at least four hours prior to the administration of the drug, the whole amount was measured, and the average taken. In No. 1 the hourly average before was ten drachms, afterwards it was reduced to six drachms. In No. 3 the average before was ten drachms, which, after the drug, was raised to sixteen drachms. This is the only time an increase was noticed, and on repeating the observation two days afterwards on the same patient, it was found that the average after the hypodermic administration was less by two drachms than it was before. From further observations, the same conclusion was arrived at—viz., that the secretion of urine is not increased by hyoscyamine.

## REPORT OF A CASE OF PLACENTA PRÆVIA; RECOVERY.

By F. H. ALDERSON, L.M.

ON June 19th I was sent for to attend Mrs. G— in her twelfth labour. On my arrival I found her in bed, but with few and feeble pains, and just reviving from an attack of flooding. I examined her. The os was high up, and not open or dilatable. As examination, however, brought on bleeding, I did not continue it, but requested my patient to keep in bed, take everything cold, and ordered her twenty minims of solution of ergot and ten minims of tincture of opium every three or four hours.

On inquiry I found Mrs. G— was seven months pregnant. Bleeding first came on the previous Thursday, after lifting a sack of potatoes (she was the wife of a greengrocer). She had very few pains, and those but slight, and as the bleeding had stopped, I did not think it necessary then to remain, and left, thinking from the history probably it was a case of accidental hæmorrhage, for there was the bleeding following a distinct and sufficient cause, which is not generally the case in placenta prævia; and although the flooding came on without pain, the pains did not increase the hæmorrhage, or if they did, they were so slight and the bleeding so little increased, as to escape her notice. But before leaving I cautioned her to have some ice in the house, in case of a recurrence of the flooding, and should it recur, to send for me at once.

The next morning Mrs. G— sent word I need not trouble to call again until I was sent for, as she was much better; the medicine had eased her very much, as well as stopped the bleeding. However, I was summoned somewhat hastily on the following Saturday, June 24th, and requested to go at once to Mrs. G—, "as she was bleeding fast." On my arrival I found my patient had just lost a quantity of blood in gushes, and said "she felt five minutes before as if she should have died before I could get to her." On examining per vaginam, I found the os dilated to the size of a florin, and dilatable, and could feel the placenta, which was centrally attached, directly over the os. I removed pieces of placenta situated immediately over the os, and the bleeding at once ceased. At this stage matters appeared from the vaginal digital examination much as I have found them when I have been called to an early abortion, when the fœtus and placenta have been expelled before my arrival, but leaving a small portion of the placenta behind, which, upon my removing, the bleeding ceased; so much was this the case that I almost instinctively asked the patient if she was sure she was seven months, and if she did not think it possible she might have passed the fœtus and placenta in the bedclothes or elsewhere. She said she had not passed anything that she knew of. I then examined the abdomen, and found the uterus about the size that would correspond to a six or seven months' fœtus. I gave another dose of ergot, and waited for a pain; for there was no more hæmorrhage. At the next vaginal examination during a pain I could feel the placenta attached to the cervical zone, which I separated with my finger, and with another pain the placenta came away in my hand. I then found, almost be-

yond my reach (for the woman had a long vagina), a hand presenting, but no other part. I then decided to turn, and sought for the foot of the opposite side, getting one of the women present to support the uterus. I brought down the foot without much difficulty, although the membranes had ruptured two or three hours previously, and completed labour within an hour of my arrival.

Mrs. G— made a capital recovery, without a bad symptom. At the expiration of a fortnight I found it was not necessary to continue my visits, and she told me, with the exception of feeling a little weaker, she felt quite as well as usual at so early a period after labour. I called on her again three weeks after labour, and found her down stairs, and quite well, but thought it right to caution her against assisting in the shop at present.

I have been induced to record this case on account of the rarity of complete placenta prævia. I have attended upwards of 1000 cases of labour during the last twelve years, and yet this was the first case of complete placenta prævia that has occurred in my practice. I have had three cases of partial placenta prævia, labour occurring at the fifth, seventh, and ninth month respectively, and in each case I ruptured the membranes, and the hæmorrhage ceased; but the child was still-born. Also because of its fatality, placenta prævia being perhaps generally considered the most alarming and anxious presentation you can have. But chiefly I have reported the case because the treatment adopted, the separation and removal of placenta, was so successful, and appeared that which was plainly indicated by nature, for there never was any hæmorrhage after I had removed that portion of placenta over the os uteri, and the entire placenta was very easily detached, and was expelled during a feeble pain with very little assistance on my part; indeed, had the head presented instead of the arm, I think labour might have been completed by nature, by the expulsion of the placenta first, and the child quickly following.

The removal of the after-birth in placenta prævia has been strongly advocated by the late Sir James Simpson, in his *Obstetric Works*, vol. i., p. 683, and I believe is undoubtedly the most successful practice as regards the recovery of the mother; and whatever treatment is adopted, the child is invariably dead. After Sir James Simpson practised the detachment and removal of placenta in placenta prævia he only lost one mother out of forty-four, whereas previously, under different treatment, he lost two out of three. A very important reason for removing the placenta in these cases is, in nineteen out of twenty cases flooding ceases when placenta is detached (Clay's *Obstetric Surgery*, p. 152). It is said the seventh month is an unfavorable time for the practice. I did not find it so, and the immediate arrest of anything approaching flooding, even after the removal of that portion of the placenta immediately over the os, convinces me we need not limit this operation of separation and extraction to cases where the exhaustion of the mother is too great to admit of turning; for although turning had to be resorted to in the case I have reported, it would not have been necessary, I feel sure, had the presentation been normal. I think it worth adding, the administration of ergot evidently assisted the expulsion of the placenta, and yet did not render turn-

ing more difficult, although the membranes had been ruptured, as I have before mentioned, two or three hours previously.

Southerton House, Hammersmith.

### CASE OF RAPID COAGULATION OF THE CONTENTS OF AN ANEURISMAL SAC BY MEANS OF COMPRESSION.

By STAFF-SURGEON G. W. J. SUTHERLAND, R.N.

(Communicated by the DIRECTOR-GENERAL OF THE MEDICAL DEPARTMENT OF THE NAVY.)

C. B—, aged twenty-nine, captain of the maintop, was received from the *Boscawen* on the 1st July, with an aneurism, about the size of a pigeon's egg, in the left popliteal space, the result of a strain when on duty aloft about a fortnight previously. Swelling and pain of the leg had been removed by former treatment. The pulsations in the sac were arrested, without diminution of its size and without stopping the circulation of the limb, by slight pressure with the thumb over the femoral artery where it leaves the pelvic cavity; but even this degree of force, when applied by means of a compressor, could be borne only for a short time. Continuous pressure was therefore only employed so as to modify the strength of the pulsations in the sac.

July 2nd.—Swelling painless and not enlarged. Genu-flexion was tried to-day, but discontinued in consequence of pain behind the knee; and compression was resorted to as before.

3rd.—Sac increased in size, its expansion being entirely lateral—i.e., across the axis of the vessel. One compressor was applied over the artery at the pelvic brim, and another at the apex of Scarpa's space, with sufficient force to render the sac all but pulseless. Considerable but not acute pain was endured by the patient—an intelligent man who understood the nature of his case,—but it was modified by occasionally making each point of compression take its turn of duty, while the other was relieved.

4th.—Sac incompressible, but pulsates slightly without expanding. All pulsation ceases on pressing the tumour against the femur. Apparatus applied as before.

5th.—Tumour solid and pulseless. No pulsation can be felt in the main artery for two inches above the tumour, nor in the anterior and posterior tibials near the ankle-joint.

As a matter of precaution, one compressor was kept on the limb with a slight degree of force till the 10th, when it was finally removed. In the meantime the tumour gradually diminished, and on the 21st was less than a walnut, its ends becoming cord-like. Pulsation in the vessels at the ankle-joint was first observed on the 20th, but nothing abnormal was detected in the state of the leg during the period occupied in establishing collateral circulation, except that it was larger in circumference than the right leg by one inch.

The apparatus mainly instrumental in completing within forty-eight hours the process of coagulation consisted of an aneurismal tourniquet or compressor, and an almost semi-circular band of

iron, which could be loosely applied over the limb at the lower part of Scarpa's space. The posterior arm of this band, which was made by a blacksmith from a gutta-percha model, was flattened out to twelve square inches, so as to afford a large area for counter-pressure on the back of the limb. Through a slit in the anterior arm could be passed the central rod (provided with a screw) of an ordinary tourniquet, the upper bar of which was fastened to the anterior arm, and a pad attached to the lower bar could be pressed upon the femoral artery by merely turning the screw. As the pad descended only one-twelfth of an inch for each quarter-turn of the screw-handle, it is evident that pressure on the vessel could be regulated to a nicety by means of this rudely constructed but efficient instrument.

Sick Quarters, Portland.

### REMOVAL OF 121 OUNCES OF PUS FROM THE LEFT PLEURA OF A CHILD AGED THREE YEARS;

WITH SATISFACTORY RESULTS.

By J. DE BURGH GRIFFITH, M.B.

EARLY in March last I was called to see a little boy three years of age, who had been ill for some time. I found the child extremely emaciated, and presenting a haggard, aged, and worn-out appearance. I observed that the abdomen was greatly enlarged, and also that the heart was beating under the right nipple; the breathing was also labored and hurried. Percussion of the left side gave dull sounds from apex to base in front and behind, and bulging of intercostal spaces. The diagnosis was not very difficult. I suggested to the parents the removal of the fluid as the last though but slender chance of saving his life, and to this procedure his parents readily assented. Accordingly my late principal and myself undertook the operation, and with a Dieulafoy's aspirator removed thirty ounces of healthy pus; but, as the child began to show symptoms of sinking, we were compelled to suspend the operation before the cavity was quite empty. The heart travelled across the chest from the right side almost to its normal position. The little patient was put to bed, had a long and refreshing sleep, and awoke in the morning with a great desire for food.

The child continued to improve from day to day, sleeping and eating well, and having no cough. However, in about a week, he began to show signs of declining. The heart was again in the right side, or, rather, the wrong side, and his breathing was distressed. On April 2nd we again tapped his chest, and this time removed 40 oz., completely removing all pus, which was still quite healthy, and about the consistency of thick cream. The respiratory sounds over the affected side were fairly pronounced. Although somewhat harsh and tubular, the chest upon percussion was very resonant, doubtless from the absence of the lung from the parietes of the chest, the lung in all probability not having expanded after the long-continued pressure against the spine and mediastinum.

After this second operation the patient improved

very rapidly, putting on flesh, and sleeping well. He took cod-liver oil and quinine, which seemed to agree with him very well.

On April 8th we thought it advisable to tap the chest again, and on this occasion took off 20½ oz. also of healthy pus. He still continued to improve, although after about ten days he seemed to decline and refuse food, was restless at night, and had some cough. The affected side was again quite dull, and the heart was displaced.

On April 21st we performed paracentesis for the fourth time, and on this occasion only got away 2½ oz., which was mixed with a blood-stained frothy matter; and, as the fluid suddenly stopped flowing into the cylinder, I should say the lung was expanded, and had probably been struck by the point of the needle, and this opinion was almost confirmed by auscultation, which showed that the lung had greatly expanded; the respiratory sounds were more vesicular. However, no bad consequences followed this operation, and the child went on in every respect very well till May 10th, when the operation was again undertaken, and 28 oz. evacuated with complete success; and the little boy is now (May 25th) so well that he can walk about by himself, and seems quite to enjoy life again.

We propose employing the drainage-tube whereby the fluid as secreted may drain away, and give a better chance for the lung to become adherent to the side.

Wotton-under-Edge.

### CASE OF A FOREIGN BODY IN THE URETHRA.

REMOVAL BY MEANS OF A WARM BATH.

By STAFF-SURGEON WILLIAM ANDERSON, R.N.,

Melville Hospital, Chatham.

(Communicated by the DIRECTOR-GENERAL OF THE MEDICAL DEPARTMENT OF THE NAVY.

J. S—, aged thirty-six, a private in the Royal Marines, presented himself at this hospital on July 27th at 6 P.M., looking pale and somewhat alarmed. On questioning him, the following facts were elicited.

Some months ago he imagined that his stream of urine was smaller than it should be, and began to use a bougie, simply, as he states, because he heard that others he knew had done the same; and, on the score of economy, he manufactured one for himself of gutta-percha, and had been in the habit of passing it two or three times a week. On the day he presented himself, shortly before noon, he passed this home-made instrument as usual, and states that while it was well into the urethra he gave it a turn, and, on withdrawing it, he found that a portion had broken off, and was left in the passage. He was at his own home when this occurred, and he at once went to a civil practitioner, who, he says, passed an instrument, and told him that he felt the obstruction, and advised him to come here, which he did, but not immediately.

After hearing the above account of the case from the man, I placed him on a sofa in the receiving-room, and carefully examined along the

course of the urethra externally, passing the finger into the rectum, and afterwards passed a No. 6 gum-elastic catheter into the urethra very slowly and carefully as far as the membranous portion, but failed to detect any foreign substance. On withdrawing the catheter the patient passed about a pint of urine in a moderately good stream, after which he expressed himself quite comfortable and free from pain or uneasiness, and, as if to convince me of the fact, he rubbed his hand along the perineum and under part of the penis. After this, and especially as I could detect no obstruction, I concluded that the broken portion of the bougie had passed into the bladder, and, "much against his will," decided to admit him into hospital for observation and treatment. He was thereupon ordered to have the usual warm bath and to be put to bed in one of the surgical wards. After he had been in the bath about ten minutes, he began to explore with his hand at the posterior part of the perineum, and there felt the portion of the bougie, and gradually and easily with his finger pressed it forward along the urethra until he got it to the external orifice, when he, "to his great delight," extracted it himself.

The question naturally arises, Where was the piece of bougie hidden when carefully examined for both externally and internally? Was it in the bulb of the urethra, or firmly fixed in the prostatic portion? Most probably the latter, for if in the former, the examination could scarcely have failed to detect it; and it is very probable that his successful effort at micturition after the withdrawal of the catheter may have forced it forward into a wider part of the urethra, where he afterwards felt it while in the warm bath. The piece of gutta-percha removed was two inches in length, and of the size of a No. 7 bougie.

My only object in publishing this case is as a hint to others who may have a similar one to deal with, and to show the happy effect of the warm bath in a case of this kind, whereby the patient may be saved from the effects of a troublesome and perhaps serious operation.

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### THE RASH OF ENTERIC FEVER.

By WYNDHAM COTTLE, M.A. Oxon., F.R.C.S. Eng.,

Senior Assistant-Surgeon to the Hospital for Diseases of the Skin, Blackfriars.

THERE are some circumstances in the following case, which I was asked to see, that seem to me worthy of record.

The patient was a well-developed man aged twenty. The history of the case showed that when he came under observation on June 6th he complained of malaise, loss of appetite, nausea, headache and drowsiness, with a furred tongue, pulse 112, temperature 101°—indeed, with all the symptoms of commencing fever. Except that these symptoms increased in intensity, he remained in much the same condition till June 10th, when I saw him. I found that his skin presented the following appearance:—The face, the whole trunk, the arms and thighs, were thickly covered with

rose-colored blotches, in parts of a darker hue, slightly raised above the level of the surrounding skin, distinctly circumscribed, and mostly circular or ovoid, and separated from each other by unaffected skin, and varying in size from the eighth of an inch to an inch in diameter, the surfaces of the blotches being smooth. They were neither accompanied by irritation nor followed by desquamation. These appearances were indistinct on the face, and absent on the scalp, inside the mouth, and below the knees. This rash in appearance was almost identical with that of a well-marked case of measles, and perfectly unlike urticaria in its color, uniformity, course, and characters.

On the following day, June 11th, the above-described blotches had greatly faded, leaving only a discoloration of the skin in the places they had occupied, which had almost disappeared on the following day (June 12th), when the characteristic rash of enteric fever showed itself on the abdomen, accompanied by the diarrhoea, &c., which marks that disease, the temperature rising to 105°·2, and running the usual course of that fever, and terminating in recovery.

In this case there were none of the constitutional symptoms of measles—no coryza, sore throat, nor any history that made the presence of that exanthem probable; nor did the eruption I have described appear on the day the rash of measles is wont to show itself, but somewhat later; nor were its course, duration, and termination similar.

I would submit that it was merely an exaggeration of the dermic injection that is not unusual in the early stages of enteric fever; and is not the inference warrantable, that many of the cases of scarlatina, or of measles in conjunction with enteric fever, of which one hears so much and so often, may be explained by supposing that such a blush, or in the more marked cases, well-defined eruption, is mistaken for the rashes which characterise those diseases? In enteric fever, it should be borne in mind, a scarlet tint of varying intensity, and presenting much the same appearances as are produced by the application of hot water to the skin, is not a rare occurrence; and, in the absence of other diagnostic symptoms, it can be distinguished from the rash of scarlet fever, which it closely resembles, by noticing that it shows itself on the day, or day but one, immediately preceding the ordinary typhoid eruption, and later in the disease than the rash of scarlatina would have appeared, and also by the absence of consecutive desquamation.

Savile-row, W.

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### STRANGULATED INGUINAL HERNIA:

EMPLOYMENT OF THE ASPIRATOR; CURE.

By HENRY BLANC, M.D.,

Senior Surgeon to the Jamsetjee Jeejeebhoy Hospital, and Professor of Surgery in the Grant Medical College, Bombay.

HEERJEBHAI N—, a Parsee, fifty-two years of age, but looking much older, weak and somewhat emaciated, was admitted into the clinical surgical

ward on July 15th for strangulated inguinal hernia of the right side. The patient states that the hernia first made its appearance some five years ago; it was small and reducible, and he always wore a truss. On the morning of July 14th, whilst straining at stool, he felt a sudden sharp pain in the hernia, and, on rising, found that it had somewhat increased in size, and that he was unable to reduce it.

*Condition on admission.*—11 A.M.: The hernia, situated in the right groin, and extending to the upper part of the scrotum, is elongated, tense, and the seat of pain on pressure; the surrounding tissues are normal. The pulse is small and compressible, the face anxious, the eyes deep set, and the skin somewhat clammy. Temperature in axilla 99°. No motion since yesterday morning. The patient suffered from nausea and eructations yesterday evening, and during the night and to-day vomiting has been frequent; the vomited matters are at present watery and tinged with bile; they are not stercoraceous. Taxis has been tried this morning by a native practitioner, but according to the patient's account much force was not used; the manipulations provoked such excessive pain that he would not allow them to be continued, and was taken to the hospital at his own request. An ice-bag was placed over the tumour, and pieces of ice given him to suck; he was also ordered a belladonna suppository.—3 P.M.: The general and local conditions are very much the same as four hours before. Previous to administering chloroform, the patient was told that, should taxis fail, advantage would be taken of the anæsthetic about to be given to proceed at once to operate. The patient positively refused to submit to the operation of herniotomy, and before inhaling the chloroform made me promise that, should taxis fail, I would not perform the other operation. Under chloroform taxis was tried, but a minute of gentle manipulations showed the uselessness of the proceeding in this case. The hernial tumour felt very tense, giving above on percussion a slight resonant sound, and to the hand the feeling of a collection of fluid tightly compressed. Not being allowed to operate, and taking into consideration the character of the strangulated hernia, I decided on puncturing it. I introduced into the hernia the finest trocar of the aspirator, and with this instrument withdrew about an ounce of slightly turbid, amber-yellow serum and a large quantity of gases. On withdrawing the cannula, the hernia slipped back into the abdomen with the greatest ease. Ordered half a drachm of tincture of opium, a grain of opium every third hour until its effects were manifest, fomentations to the abdomen, ice to be sucked, and milk and broth diet.

July 16th.—The patient passed a good night. The bowels have been moved twice. Complaints of no pain in the abdomen; feels well. Temperature in axilla 98.5°; pulse 84, of a fair volume.

The case progressed most favorably; not a single bad symptom showed itself. The opium was discontinued the second day. Liquid diet alone was allowed for a few days, when more substantial food was permitted. On the 24th he was discharged.

## ON A CASE OF

## NERVOUS IRRITABILITY ASSUMING A HYDROPHOBIC CHARACTER.

By FLEET SURGEON JOHN T. GABRIEL, R.N.

(Communicated by the DIRECTOR-GENERAL OF THE MEDICAL DEPARTMENT OF THE NAVY.)

S. M.—, aged fifteen, second-class boy, came under my observation on the 1st of June, on account of the trouble he gave in resisting every attempt to place him into a bath in the bath-room, in accordance with the daily practice among the boys. The attempt always elicited from him loud shrieks, and caused him to struggle violently, and indeed he evinced the utmost terror of immersion. I accompanied him to the swimming-tank, where the depth of water is four feet, and on that occasion I witnessed the effect upon the patient when he was told to go into the water. He shrieked, his eyes became prominent and fixed in a stare of horror, countenance livid, mouth open, and the patient gasping and breathless; indeed, he appeared about to pass into convulsions. On being relieved from his apprehension of having to go into the water, he instantly recovered, and assumed his natural appearance. The attack struck me as bearing a close resemblance to one of hydrophobia, according to the descriptions of this malady which I had read.

I recommended that the patient should be placed in the school-list, and not again be forced to go into the water. On questioning him, he stated that when the fear of the bath assailed him, he was seized with an oppressive and acute pain in the right side, at a point corresponding to the diaphragm, and accompanied with extreme difficulty of breathing, and that the mere application of water to the chest caused the same sensation, only in a less degree. This account was quite consistent with the character of the attack. On further questioning the boy, he said the pain extended from the lower thoracic region, shooting through the right shoulder, and that he felt unable to stand. He complained also of pain in the side occurring every morning and evening, and that it invariably woke him up at four A.M., and has done so for the last twelve months. He states three years ago he fell into the water, and was nearly drowned, having been rescued in a state of insensibility, in which he remained for two days, and lost the faculty of speech for two weeks.

With the exception of the above remarkable symptoms, the boy's health exhibited no defect. The condition appeared to be one depending upon fright arising from the accident mentioned above, and the attack which always followed a threat of putting him into the water would appear to depend upon the paralyzing effects of fear on the brain and nervous system, and through them upon the muscles of respiration, of which the diaphragm seems in this case to have been chiefly affected, and thrown into a painfully spasmodic state, preventing inspiration, and, through compression of the phrenic nerve, giving rise to the pain shooting through the shoulder.

Upon this view of the case, the treatment pursued was the administration of one-thirtieth of a grain of strychnine three times a day, and the application of electro-galvanism. These, combined



with gentle and encouraging words, seem to have succeeded in restoring confidence, as the boy now voluntarily enters the bath, and declares that he likes it.

### DISLOCATION OF THE HIP IN A GIRL AGED EIGHT YEARS, REDUCED BY MANIPULATION, WITHOUT CHLOROFORM.

By H. W. COLEMAN, L.R.C.P., M.R.C.S., &c.

THE extreme rarity of such cases, the peculiar accident, and the mode of reduction induce me to publish the following interesting case.

On the evening of Tuesday, April 25th, I received a message requesting me to see a daughter of Mrs. W—, residing some distance from my house, who had received a severe injury to the hip. I was unable to see the case that night, and requested my assistant, Mr. W. B. Broughton, to do so, who immediately on seeing the case diagnosed it readily.

It appears this child was being pursued down the street by two boys with iron hoops. She entered a passage dividing two blocks of houses, and having got midway was overtaken by one of the hoops passing between her legs, which threw her down with much force, and by some unaccountable circumstance she fell with one leg through a sort of trap-door into a cellar, the iron grating of which had been previously displaced.

When found she lay upon the side on which the dislocation had taken place, suffering most intensely from pain and shock, also quite unable to stand. My assistant placed her in bed in the most comfortable position possible, and ordered hot fomentations to be applied until the case was seen by me. I may here state that the infrequency of such cases and the fact of my having only seen one similar case, and that under the care of Mr. S. Hey, during the period of four years, made me very dubious of the diagnosis.

I did not see the case until early next morning, having been called up owing to the restlessness and suffering of the child. I had her placed in the erect position by the side of the bed, and from the very characteristic features of the deformity recognised it at once as being one of dislocation of the left hip, with head of femur resting on the dorsum ilii. There was marked inversion, the knee turned inwards towards the sound side, the ball of the great toe resting on the dorsum of the right foot, and on measuring there was an inch and a half of shortening; also the head of the femur could be distinctly felt and seen in its new position.

I laid the child on the bed, flexed the thigh well on the body, rotated outwards, abducted, and suddenly extended. To my great satisfaction, and to the delight of all present, the sharp snap which is so unmistakable in these cases was audible throughout the room; and the child, whose previous sufferings were indescribable, exclaimed, "I am all right now; the pain is gone." I put on a Liston's splint and kept her in bed for a month, and in five weeks after the accident I was somewhat surprised

to find her playing in the street without a vestige of lameness.

Armley, near Leeds.

## A Mirror

OF

## HOSPITAL PRACTICE, BRITISH AND FOREIGN.

Nulla autem est alia pro certo noscendi via, nisi quamplurimas et morborum et dissectionum historias, tum aliorum, tum proprias collectas habere, et inter se comparare.—MORGAGNI *De Sed. et Caus. Morb.*, lib. iv. Proœmium.

### LEEDS GENERAL INFIRMARY.

#### CASES OF ACUTE RHEUMATISM TREATED BY SALICIN AND SALICYLIC ACID.

WE regret that we have been unable to publish earlier the following interesting records, which throw much light on the value of salicin and salicylic acid in the treatment of acute articular rheumatism, and for which we are indebted to Mr. E. H. Jacob, M.B., house-physician.

CASE 1. (Under the care of Dr. EDDISON).—A. P—, aged nineteen, admitted March 15th. Had had pain in his joints since Jan. 3rd. On admission pain was not very severe. Temperature 99° F.; urine acid, 1027, containing albumen. He was treated with alkalies and a blister applied to the right knee. On the 25th the evening temperature rose to 102·6°; on the 28th to 102·8°. During the next five days the temperature gradually sank, but on April 1st, 2nd, and 3rd was 101°, and the pain was very severe. The patient continued on the same treatment, the temperature being on an average 100° for the next eleven days. On the 15th the evening temperature was 101°, pain very severe, especially in the intercostal muscles. The patient began to take ten grains of salicin every two hours, and for the next sixteen days took from thirty to sixty grains per day. The evening temperature, however, during this period for nine days rose to 100°, and for the next seven days, with one exception, ranged between 99° and 100°. On the 20th (six days after beginning to take the salicin) a pericardial rub was detected with an increase of cardiac dulness, accompanied with much pain in the precordial region. The friction sound remained till May 4th, when he began to convalesce, and he was discharged on May 12th, a systolic murmur being audible at the apex of the heart and a diastolic over the aorta.

CASE 2. (Under the care of Dr. CLIFFORD ALBUTT).—G. C—, aged twenty-eight, admitted April 5th. Had had general pain for the last five weeks, very severe five days; very restless, pale, and distressed. Temperature 102°. Systolic murmur heard at the apex of the heart. Pain in all the joints, and intercostal muscles on left side; face and trunk profusely perspiring. He was treated with alkalies, the pain being relieved by hypodermic injections of morphia. His temperature varied between 102° and 103° for four days.

then gradually sank to 100°.—April 16th: Evening temperature 100·8°; pain continued very severe.—17th: Salicin was given in ten-grain doses every hour; evening temperature 101°.—18th: The same amount was given, except for four hours; evening temperature 99·6°.—19th: Salicin every two hours; temperature (evening) 99·4°; much less pain. The salicin was continued, ten grains every two hours, for a week, the temperature only once reaching 100°, and the pain decreasing. He remained in hospital for three weeks longer in a very anæmic state, with occasional pain and stiffness in his joints.

CASE 8. (Under the care of Dr. EDDISON.—A. D.—, aged seventeen, admitted April 18th, with painful swelling of both ankles, knees, and shoulders, and the right wrist. She had been laid up for a fortnight; temperature 100·1°. Mitral systolic murmur. She was given an alkaline mixture.—April 24th: Both shoulders and the right knee very painful. She was ordered fifteen grains of salicin every three hours. She improved greatly, and on the 28th was almost free from pain. The salicin was given every four hours till May 1st, when there was only some slight stiffness in the right shoulder, which was relieved by a blister.

CASE 4. (Under the care of Dr. HEATON.—J. F.—, aged thirty-two, admitted April 18th, in a fourth attack of acute rheumatism. He had been in severe pain for three days. Both knees were swollen and tender; shoulders very painful. Temperature in the evening 102°. Cardiac dulness increased, with a systolic murmur at the apex. Urine alkaline.—19th: Took sixty grains of salicin. Evening temperature 102·8°.—20th: Took sixty grains during the day. Feels much easier; tongue cleaner. Evening temperature 103·2°.—21st: The medicine seemed to cause diarrhoea, and was omitted. Evening temperature 102·8°.—22nd: Feels much better; joints looser. Evening temperature 101·6°.—On the 23rd and 24th he was not so well, the evening temperature rising to 102°, and both hands becoming affected. On the 25th, salicin in fifteen-grain doses every two hours was ordered; this was taken for three days without any apparent effect. The salicin was then taken every three hours, and an alkaline mixture given thrice daily for five days; the evening temperature still varying between 100° and 102°. On May 4th the salicin was given every two hours. Evening temperature 99·8°. There was some pain in the knees and elbows. On the 7th the evening temperature was 98·6°, and the medicine was left off. The temperature rose, however, to 101·4° the next evening, but unaccompanied by pain. The patient remained in hospital for twenty days after this, the evening temperature for fourteen days varying between 99° and 100°. He complained of some stiffness in the joints, but was discharged cured on May 30th, after a stay in the hospital of six weeks.

CASE 5. (Under the care of Dr. HEATON.—Admitted May 8th, having been laid up three weeks with pains in the joints. On admission, face was flushed, both ankles, knees, and left elbow tender and swollen. Evening temperature 101·6°. Heart-sounds normal. To take fifteen grains of salicin every two hours. Began the medicine on the evening of the 9th.—10th: Temperature in the morning 98·8°; in the evening 101·2°.—11th: Temperature in the morning 100·4°; in the even-

ing 100°. Legs are better, but wrists and elbows painful.—12th: Feels better; wrists swollen. Evening temperature 100·4°.—13th: Much the same. Evening temperature 100·2°. The next day the temperature sank to 99·4°, and, except on one occasion, remained below 100° till his discharge on June 6th. The salicin was continued three times a day till May 27th, but the pain in the joints was not entirely removed till June 5th.

CASE 6. (Under the care of Dr. HEATON.—E. M.—, aged twenty, admitted May 12th. She had had a previous attack six years before, being laid up three months. A week before admission she was seized with rigor, sweating, and pains in the limbs. Both ankles, knees, and the right elbow and wrist swollen and painful; face flushed; skin dry; systolic murmur audible at apex. At 9 P.M. on May 14th began taking salicylic acid, fifteen grains every two hours; the evening temperature on 12th and 13th having been 101·8° and 101·6°, and on the 14th 101·8°.—May 15th: In the evening the pain had entirely gone, except some slight stiffness in the right hand. Evening temperature 101°. From this time the temperature gradually fell, and the evening temperature became normal on the 18th. The salicylic acid was discontinued on the 17th, having given rise to sickness, and an alkaline mixture was ordered. The patient remained in hospital for a fortnight longer in a very anæmic state, but with no return of rheumatic pain.

CASE 7. (Under the care of Dr. HEATON.—J. A. J.—, aged twenty-two, admitted June 2nd. She had had a slight previous attack. She had a rigor ten days before, and had been laid up since. On admission the right shoulder and wrist, left knee and hip-joint were swollen and tender. Pulse 110; evening temperature 104°. Sweating profusely. A systolic murmur was audible at the apex. The next day the morning temperature was 100·8°. She began taking fifteen grains of salicylic acid every two hours. Evening temperature 102°. On the 3rd, evening temperature 100·2°. On the 4th, 99·6°. A little pain was felt in knees and thighs.—5th: Feels well. There is slight stiffness in the hips, but no pain. She sleeps well, and has no sickness, diarrhoea, or catarrhal symptoms. Salicylic acid to be taken every six hours. The next day the medicine made her sick, and was discontinued. She was discharged cured on the 9th, after a stay in hospital of eight days.

CASE 8. (Under the care of Dr. HEATON.—H. T.—, aged twenty-seven, admitted June 21st. Has had pain in knees and ankles ten days, gradually getting worse. On admission, both ankles, right shoulder, and elbow were painful and tender. Profuse perspiration; tongue coated, systolic murmur at apex. Evening temperature 100·6°. On the 23rd began to take fifteen grains of salicylic acid every two hours. In the evening he had had sixty grains. He was quite free from pain. Temperature 98°.—24th: Still sweating; bowels rather loose. Temperature, morning 99°, evening 98°; pulse 60. Still free from pain.—25th: Still sweating, but with no pain. Temperature 99·2°. To take the powders every six hours.—26th: Doing well. No pain. Temperature normal.

CASE 9. (Under the care of Dr. HEATON.—J. M.—, aged twenty-two, admitted June 22nd, with pain in joints of six days' duration. His knees, right ankle, and left wrist were swollen

and tender, and his hips very painful; tonsils much swollen and inflamed, especially the left; heart's apex beats in normal position; there was a loud systolic murmur over apex and aortic valves. He was given Dover's powder, ten grains, but slept very little that night. Temperature 102°.—23rd: Ordered salicylic acid, fifteen grains, every two hours. In the evening he had taken sixty grains. All pain was gone except very slight pain in the hips and that in the throat. Evening temperature 102.2°.—24th: Left tonsil has discharged, and his throat feels much better; has slight pain in right knee only; had retention of urine for about fourteen hours. Evening temperature 100.6°.—25th: Feels well; has no pain. Evening temperature 99°.—26th: Doing well.

*Remarks.*—The above cases seem to show a great superiority in salicylic acid over the alkaloid in the treatment of rheumatism. In none of the cases treated with salicin did the drug affect the pain or the temperature as in those treated by the acid, while the fact that pericarditis ensued (in Case 1) while the patient was taking salicin would indicate its inability to arrest the disease. On the other hand, in the cases treated by salicylic acid the influence of the drug was most marked, the pain being considerably or entirely removed within twenty-four hours, while, except slight sickness in one case, no unpleasant symptoms followed its use. It is unfortunate that in nearly all the cases cardiac complication had taken place before the patients came under treatment.

#### UNIVERSITY COLLEGE HOSPITAL.

IMPASSABLE STRICTURE; INDURATION OF PERINEUM AND LIMITED EXTRAVASATION OF URINE; ABSCESS; PARTIAL RETENTION; PUNCTURE PER ANUM; ABNORMAL ARRANGEMENT OF PERITONEUM; DEATH.

(Under the care of Mr. BERKELEY HILL.)

FOR the following notes we are indebted to Mr. A. P. Gould, surgical registrar.

J. W—, aged sixty-one, had led a moderately healthy life. When a boy he had gonorrhoea, which lasted nine months. Had no trouble in passing urine until three years ago. Then a lump came in the scrotum, with some impediment in micturition. This disappeared, but frequently returned afterwards. Seven months before admission he was in another hospital with the same swelling, when a catheter was passed and the perineum slit up. He got well, and soon left the hospital. For three months the swelling had been enlarging again, and on admission the scrotum was larger than the head of a child of one year; the swelling—hard, not fluctuating or tender, of purple color—extended over the pubes and penis into the perineum, where there was a scar in the mesial line, which had opened, and whence serous fluid exuded. The urine, voided in a stream by the natural channel, was alkaline and slightly albuminous. No catheter could be passed beyond a small portion of the stricture. The patient was feeble, with a furrowed tongue; full, rapid, irregular pulse; and considerable atheromatous rigidity of the arteries. Percussion of the abdomen gave a dull note for two inches above the pubes, and manipu-

lation discovered a round firm mass, feeling somewhat like an orange, in the mesial line above the pubes. If this mass were pressed down while the finger was in the rectum, irregular fluctuation could be just felt behind a prostate enlarged apparently to double the normal size. Attempts to pass a catheter, after prolonged trial on the 10th, failed. An incision on each side of the middle line into the abscesses and cedematous tissue of the perineum and scrotum was made, and stimulating and nutritious food was given, and warm poultices applied to the perineum.

The next day the patient was easier; had had some sleep in the night, and taken plenty of food. The urine, passed three times in the night in a stream, was dark, fetid, with moderate deposit of pus. Perineal swelling less brawny; matter weeping from the incisions, but apparently no urine escaping by that way. The succeeding day the swelling had increased again; urine passed only in small quantities and with great effort. Another attempt to pass a catheter failed to do more than insinuate a No. 4 silver partly through the stricture; when it had penetrated some distance, the stem was blocked so firmly in the indurated tissue of the stricture as to become immovable by any force it was thought prudent to employ. The patient's strength was less than on the previous day, the swelling increasing, and the bladder slowly getting more and more distended. The patient was put under chloroform, and the bladder punctured per rectum. The long distance of the *bos fond* from the anus allowed very little of the cannula to project into the bladder; a flexible catheter was passed through it, and, with the cannula, fastened to the buttocks in the ordinary manner. The urine ran freely through this tube, and the patient remained free from pain until the next morning, when he complained of pain at the anus, which was attributed to the cannula, and an attempt was made to withdraw it while leaving the catheter *in situ*. This failed, and the urine, which had continued to run away freely through the catheter since its insertion, and become clear, acid, and free from pus or smell, ceased to flow. This condition remained unchanged till 5 P.M., when Mr. Hill, on his visit, ascertained the cannula and catheter had escaped from the bladder into the rectum, the latter instrument being doubled backwards at the point where it had projected into the bladder beyond the cannula. In addition to this, the inflammatory oedema of the scrotum had now passed to the buttocks and half way down the inner side of the right thigh, with an abrupt, irregular line of demarcation, and here and there vesication. Temperature 108° F. No tenderness of abdomen, which was soft and yielding. The bladder could not be distinguished now through the abdominal wall or per rectum. Patient had no desire to pass water. At 10.30 P.M. the patient was suffering great pain. Temperature 108° F. Abdominal walls flaccid, not tender; the bladder could be indistinctly felt. The patient was put under chloroform, and the rectum trocar inserted a second time into the bladder. Urine flowed in fair stream, and the trocar was fastened in. Little improvement followed this; and the next morning the erysipelatous blush extended over the left buttock, the thigh, and the flank. Two days later the patient died.

At the post-mortem examination extensive general peritonitis was found, most intense at the

pelvis. The pelvic viscera were removed in one mass. The recto-vesical pouch of the peritoneum (very long) was found to extend completely past the trigone of the bladder and to reach quite up to the prostate; accordingly, both the punctures from the anterior wall of the rectum to the trigone of the bladder passed twice through the peritoneum. A very tight stricture occupied the membranous and bulbous part of the urethra, which only admitted a fine probe. A short false passage passed into the dense tissues surrounding the urethra. The tissues of the perineum were immensely thickened, and traversed by a narrow fistula from the urethra just behind the stricture to the wound in the perineum. The prostate was enlarged; the bladder distended, hypertrophied, and sacculated. The mucous membrane was dark-colored from old cystitis; it was marked with two trocar punctures at the trigone, about half an inch in front of the orifices of the ureters, but near the middle line, and half an inch behind the prostate. The ureters and pelves of the kidneys were also greatly enlarged, the kidneys much wasted by interstitial nephritis.

LEUCOCYTOSIS, WITH ELEVATION OF TEMPERATURE;  
DEEP-SEATED SUPPURATION; DISCHARGE  
OF PUS; RECOVERY.

(Under the care of Sir WILLIAM JENNER and  
Dr. REYNOLDS.)

For the notes of the following case we are indebted to Mr. A. E. Broster, physician's assistant. One tempting fallacy presented itself in the case. The number of white corpuscles began to diminish soon after the internal administration of phosphorus was begun, not, we may judge, as the result of any special action at the time, but coincidentally with the maturation of the abscess and the discharge of the pus.

A pale, weakly-looking lad, aged seventeen, was admitted on March 18th into Ward 8 with perityphlitis, from which he seemed in a short time to recover entirely. The extreme pallor of the face did not, however, disappear, and the temperature remained persistently above normal—about 100° 8'. Although there was no apparent enlargement of the spleen or any other glands, the blood was examined microscopically on April 27th, and found to present the following appearances. The colored corpuscles were yellowish-brown, did not run into rouleaux, but cohered at their edges, while after a few minutes their individual outline was lost altogether. As many as seventy-six white corpuscles were counted in a not overcrowded field. The patient continued to lose flesh, and the pallor and high temperature continued. On May 5th no less than 130 white corpuscles were seen in the field, and the diagnosis of leucocythæmia was made by Sir William Jenner. Phosphorus, in one-thirteenth of a grain doses three times a day, was given. When the blood was examined again, on May 14th, the same excess was observable, but on the 22nd not more than fifty white corpuscles were seen in the field. A few days later the boy complained of uneasiness in the right lumbar region, but as nothing could be seen beyond lateral curvature of the spine, no further notice was taken of it at the time; but on June 4th a large abscess was recognised in this region, and was aspirated. On examining the blood on the 14th of June, only twenty-eight white

corpuscles were seen. The abscess was subsequently freely opened on the 21st, and a drainage-tube inserted. From this time the boy gained flesh and strength and improved in appearance, though the temperature remained above normal. A month later, during which the abscess continued to discharge, the blood was again examined, the number of white corpuscles being but slightly in excess of their normal proportion, but markedly less than when previously examined. There was, in addition, a large quantity of granular matter, evidently protoplasmic.

The general condition is now considerably better, although the temperature is still a little above normal. On the 8th inst. the abscess was still discharging profusely, the number of white corpuscles was in normal proportion, and the quantity of granular matter had greatly decreased. The patient continues to take phosphorus as well as cod-liver oil and iron.

## SEAMEN'S HOSPITAL, GREENWICH.

### TWO CASES OF UNUNITED FRACTURE.

(Under the care of Mr. W. JOHNSON SMITH.)

A POINT of interest in each of the following cases is the small amount of constitutional and local reaction produced by the severe surgical procedures. This Mr. Smith is disposed to attribute to the employment of antiseptic precautions. The second case is still further interesting, because it tends to confirm a statement made by Mr. Erichsen that Dieffenbach's operation is particularly successful in ununited fracture of the humerus.

CASE 1. *Ununited fracture of bones of leg.*—L. 8—, aged twenty-nine, a Norwegian sailor, was, when serving at sea on March 4th, 1875, struck down by a heavy wave, and received a fracture of the right leg near the ankle. During the first five weeks after this accident the man was laid up on board, lateral splints of wood having been applied to the injured limb. At the commencement of the sixth week he was admitted into the hospital of an English port, where he was treated up to the end of July. On July 31st, five months after the date of the accident, he was admitted into the Seamen's Hospital at Greenwich. It was then found that fracture had taken place at about the middle of the lower third of the right leg, and that both bones had been involved. There was no appreciable shortening of the limb, and no marked overriding or projection of the upper or lower fragments. The lower fragments, both of the fractured tibia and the fractured fibula, were freely movable, and there was much tenderness along the line of fracture, which extended transversely across both bones at almost the same level. No crepitus could be made out. The patient was unable to bear firm pressure on the sole of the right foot, and could not move about save on crutches. The right foot was slightly atrophied, and the integument about and below the seat of the injury was smooth and cold, and marked occasionally by pale, livid patches. The case was at first treated as one of retarded union. Firm pressure was applied immediately above and below the fracture by means of pads of lint and strapping, and the injured limb, from the middle of the thigh down to the toes, was encased in pasteboard

splints and a thick coating of bandages saturated with water-glass (silicate of potash and magnesite). On removal of this apparatus on October 4th, there was found to be less mobility of the fragments, though the progress towards firm union had not yet been very satisfactory. On October 11th, after very free twisting and rubbing together of the fragments whilst the patient had been placed under the influence of ether, a second fixed apparatus of a similar kind was applied. The patient, after an interval of four days, was allowed to move about on crutches and sit in the open air. On October 27th, when the leg was again uncovered, the fragments of the tibia were found still freely movable, whilst those of the fibula seemed to be much less so. No thickening whatever of the applied ends of the tibial fragments, and no persistent swelling and congestion of the superjacent soft parts, had hitherto been produced by the practice of retention and compression carried on between the beginning of August and the end of the following October.

On Nov. 1st, 1875, after the administration of ether, and the right leg having been rendered bloodless by Esmarch's apparatus, a long vertical incision was made on the inner surface of the limb and carried down to the tibia at the seat of fracture, and for some distance along and below this point. The ends of the upper and lower fragments, which ends were rough, jagged, and uncovered by any fibrous structure, were then forced through the wound and sawn off very obliquely from below upwards and outwards towards the fibular portion of the wound. The two fragments of the fibula, which could be readily separated, were just clipped at their extremities by means of bone-pliers. Two holes having been drilled in the inner wall of the tibia, one above, the other below the solution of continuity, a thick wire was passed through each of these, and then fastened by three turns in order to bring the fragments of tibia together and to retain the raw surfaces in contact. The operation was performed under the carbolic acid spray; the edges of the wound were brought together by prepared sutures over a drainage-tube, and the seat of the operation was covered by antiseptic gauze and the accessory applications. The limb was then placed on a back-splint of iron and finally suspended. The general reaction after the operation was mild. On the evening of the day after the operation the temperature was 101°, on the following day it fell to below 100°, and afterwards remained normal. No superficial inflammatory action was observed at the seat of the operation during the dressings, which were changed every sixth day with attention to antiseptic details. The progress towards firm union of the bones, though very slow, was satisfactory. At the end of December there was much thickening both of bone and of soft parts about the wire ligature, but the fragments were still freely movable. At the end of January, 1876, there was but slight movement. Early in March, when the union was pretty firm, a water-glass bandage was applied to the limb, and the patient allowed to move about on crutches. On March 28th union was firm, there was very little swelling of the limb, no distortion, and the movements of the foot at the ankle-joint quite free. On May 2nd the wire ligature was untwisted and removed. The patient was discharged on June 3rd, with the fragments firmly and regularly united, and he was

then able to walk well and without the support of a crutch or stick.

**CASE 2. *Ununited fracture of humerus.***—M. M—, aged twenty-six, was admitted into hospital on Dec. 27th, 1875, with a simple fracture of the right humerus produced twenty-four days previously through a fall from a yard. The fracture extended through the junction of the middle and lower thirds of the shaft; it was not very oblique, and there was but little tendency to over-riding of the then very movable fragments. Shortly after the patient's admission the injured limb was put up on an internal angular splint, reaching from the armpit to the hand. On Jan. 10th, 1876, the seat of the injury was firmly strapped, and the whole limb fixed in a water-glass bandage and pasteboard splints. On March 4th the fragments were still very movable, and the arm quite useless. The ends of the fragments were freely rubbed together on March 7th, and another fixed apparatus applied. On March 25th the arm was again uncovered, and put up for the third time. From March 7th to the 29th the patient was kept in bed.

As no satisfactory result had been effected by the above-mentioned treatment, and as the upper and lower fragments of the broken shaft were still freely movable on each other, the patient was placed under the influence of ether on May 1st, the seat of the fracture exposed by a vertical incision made on the outer surface of the limb, and three ivory pegs driven into holes drilled in the wall of the bone, two pegs being fixed above and one below the line of fracture. The applied ends of the fragments were not separated from each other in the operation. The limb had been rendered bloodless before the operation; the wound was made under the carbolic-acid spray, and dressed antiseptically.

On the evening of the day of operation the axillary temperature was 100°; on the following morning it was normal, and subsequently remained so. The wound healed rapidly and completely, so that the outer broad ends of the ivory pegs were covered over by sound cicatrix. On July 8th there was firm union, and the limb could be freely moved save at the fingers, which could not firmly grasp any object; at this date two of the pegs, which were felt to be quite loose, were removed through a small incision. On July 15th the third peg was removed. In each peg a considerable portion of the lower and pointed extremity had been removed, and the stump was jagged and slightly discolored. The patient was discharged as cured on July 23rd; the movements of the right hand and fingers were, however, still feeble.

### LONDON HOSPITAL.

PARTIAL CONVULSIONS FROM BRAIN DISEASE; STREPHILIS; OLD DEPRESSED FRACTURE; TREPHINING.

(Under the care of Mr. MAUNDER.)

For the following interesting notes we are indebted to Mr. Herbert W. Page, F.R.C.S., lately surgical registrar.

The notes of this case illustrate the onset and progress of partial unilateral convulsions from localised brain disease, as bearing on the experi-

ments of Hitzig and Ferrier, and the views of Dr. Hughlings Jackson. The discharging lesion (most probably syphilitic) was no doubt determined by the fracture of skull—an injury which had in itself originally given but little trouble.

John H—, laborer, aged thirty, admitted into the hospital on April 26th, 1875, had always had good health with the exception of syphilis, contracted some four years before admission, when he had a chancre called "dry," and followed by rash and sore-throat. About one year after the sore, while at work, a brick fell on the left side of his head, causing a "large lump," but no other inconvenience. Six months after this accident he received a blow with an iron bar at the same spot. He was but momentarily insensible, and continued at work, feeling as well as usual in two or three days. He remained well until August, 1874, when, on returning to work one day after dinner, he felt "drowsy, and was in a semi-unconscious state," followed shortly by a fit, in which, he was told, he had suddenly screamed, become black in the face, and fallen down unconscious. He had four more fits on the same day, and two three weeks afterwards. He remained free from these attacks until April 19th, 1875, and between that day and his admission to the hospital he had three others. He added that he had never felt quite the same man since the accident, and that for a few weeks after the first fits his sight was bad, and he was unable to read. He was sent to the hospital by Dr. Kelly, of Rotherhithe, under whose care he had hitherto been, and on admission his chief complaint was of "fits, and numbness and weakness of the right side and arm."

An irregularity of surface, about an inch in diameter, and apparent deficiency of the outer table of the skull, were found near the anterior margin of the left parietal bone, about an inch and a half from the anterior superior angle, and, by the aid of one of Turner's diagrams, inferred to be over the hindermost part of the middle frontal convolution.

To use his own words, "the fits begin with a tingling in my right hand and a drawing up of the arm and hand, and as soon as the arm is drawn right up I go off and can remember no more. I also have tingling in the right side of the body and the right cheek. I feel a sort of stupefied, and the bowels seem as if they wanted to be moved." There was some weakness of the right arm and slight impairment of sensation. He made no complaint of the right leg. Small doses of the solution of perchloride of mercury were given, and his condition generally improved; the arm felt stronger, and his mind was brighter. On May 18th he had a slight fit, which he described as beginning in the right little finger, but not reaching higher than the shoulder. He did not lose the power of speech, though in previous *slight* attacks, while conscious and able to hear and understand others, he had been himself unable to talk. The note of June 5th is that the patient had a sensation of "deadness," commencing in the right side of the head, proceeding down the right shoulder and arm, and thence to the right side and leg. There was with this no twitching of muscles, but diminished power, lasting for half an hour, during which there was increased action of the heart. His temperature was normal and his urine natural while in the hospital, and on the day of his dis-

charge (June 11th) he certainly felt better than when he came in.

He returned on June 22nd, evidently not so well; he was pale and anxious-looking, and markedly thinner, and the fits are now described and observed as commencing with spasmodic twitchings of the right angle of the mouth, deviation of the tongue to the right, and inability to speak, succeeded by numbness without twitching of the right thumb and adjoining three fingers, without loss of consciousness. Four such attacks were very transitory, and consisted merely of a "queer sensation in the head, as if the head were dead," lasting, with inability to speak and without unconsciousness, for five minutes. Numbness in parts spasmodically affected usually lasted for about two hours after a "discharge."

Thinking that some good might result therefrom, and with the advice and approval of Dr. Langdon Down, Mr. Maunder trephined at the centre of the depression on July 7th, and on elevating the segment of bone, found a small depressed spicule of the inner table embedded in dura mater. There was obviously some fibroid thickening round and about the exposed portion of dura mater. The wound gave no trouble; it healed gradually and kindly; and the temperature, never above 100°-2° F., had fallen to, and remained, normal after the third day. He was comparatively free from fits or abnormal sensations until July 15th, when he had four "warnings"; a tingling sensation in the right little finger, and similar attacks on this and the following day were stopped by rubbing the hand or tightly bandaging the arm. The patient expressed himself as being mentally clearer than before the operation—he certainly seemed so,—and said he enjoyed reading the newspapers, which before he had quite given up.

On July 23rd he had a fit, beginning in the right little and ring fingers, going up the arm to the side of the face, and thence down the right side to the leg; twitching of all these parts being noticed for fifteen minutes. Slight occasional seizures recurred up to the end of July. During August, he complained of pain in the head, with more marked loss of power, and impairment of sensation in the right hand and arm. He was moreover in very low spirits.

On August 17th a fit, seen by Mr. Mercier, is thus recorded:—"Patient attracted attention by a peculiar snorting noise, and when seen had a definite right-sided convulsion, affecting chiefly the face, and the hands in much less degree. The shocks were rapid and sudden, precisely like those of an ordinary epileptiform seizure. The mouth was most involved, the eyelids next, and the eyes apparently not at all. There was no loss of consciousness. He attempted to speak, and succeeded in saying 'water' once or twice in the course of the fit. Immediately after the fit he spat up a little florid blood, and the mouth on movement was drawn to the left, and the right eye closed less completely than the left. Five minutes after the fit, the facial paralysis was only slightly marked, and no difference could be detected in the grasp of the hands. A quarter of an hour after he complained of severe headache." During this day he had arrested several slight attacks by pressing his jaw upwards with his right hand.

On August 23rd he had a fit involving the right leg, after spasm of the face and arm; and on

August 24th the optic discs were observed hazy at the margin, and the note is: "Query, commencing neuritis?"

On Sept. 7th he had another fit, face, arm, and leg being affected, and described by him as the "stiffest" since he came into the hospital. He complained more of his head, and of his sight getting weak; and on Sept. 10th, the day before he was taken from the hospital by his friends, ophthalmoscopic examination revealed "well-marked double optic neuritis."

On Jan. 1st, 1876, Dr. Kelly wrote that the "condition of the man had been one of physical and mental imbecility since he left the hospital; that he had been comparatively free from the epileptic fits, except spasmodic twitchings of the right upper extremities, and which alternated with the most distressing hiccup, the one regularly ceasing as soon as the other began." He died early in February, but, unfortunately, no post-mortem examination was allowed.

### ST. MARY'S HOSPITAL.

CASE OF CHOREA, CURED BY CHLORAL HYDRATE AND BROMIDE OF POTASSIUM, AFTER FAILURE OF CONIUM.

(Under the care of Dr. SIEVEKING.)

In the case the notes of which are subjoined, and for which we are indebted to Mr. Sworder, conium seemed not to be productive of any perceptibly good effects, while faradisation did positive harm. The girl was for a time quieted by the inhalation of chloroform and by the subcutaneous injection of morphia; but a mixture of bromide of potassium and chloral hydrate appeared to be the active agent in checking the irregular movements, and in setting the child on the road to cure.

Emma B—, aged twelve, was admitted Feb. 29th, 1876, suffering from chorea. She was taken ill a month before, and three weeks after a severe fright. On admission, she had well-marked symptoms of chorea. The lower extremities were not much affected, but the clonic movements were seen chiefly in her arms and neck. She could shake hands and squeeze any object fairly well; tongue clean; bowels regular; heart-sounds normal. She had never had rheumatic fever. Temperature normal; pulse of fair strength, regular; lung-sounds healthy. To have broth diet, two pints of milk, and one pint of beef-tea. Ordered two drachms of the juice of conium three times a day, and half a drachm of chloral draught when necessary.

March 2nd.—Conium increased to three drachms.

3rd.—Conium increased to four drachms.

7th.—Ordinary diet and one egg. She seems a little better; bears the conium well; bowels open; tongue clean.

10th.—To discontinue conium, as she shows no material improvement. Ordered ten grains of peroxide of iron as a confection with a drachm of treacle three times a day. Urine: sp. gr. 1034, acid; no albumen; no sugar.

13th.—Ordered half an ounce of conium three times a day. To discontinue the iron.

14th.—Faradisation to be applied to the spine and extremities twice a week.

17th.—Faradised for the first time yesterday; does not seem so well to-day. To discontinue the conium, and to take three drops of solution of arsenic, with two drachms of steel wine three times a day.

19th.—Was faradised again to-day; she was decidedly worse in the evening, throwing herself about a great deal, and being fed with difficulty; pulse very feeble; she passes urine and feces involuntarily.

20th.—Slept very little. Is worse than yesterday. Ordered ten grains of bromide of potassium and five of chloral hydrate at night.

21st.—Slept very badly. In the afternoon the arsenic and iron were discontinued, and ten grains of bromide of potassium and ten of chloral, three times a day, were ordered. It was very difficult all day to keep her in bed, and almost impossible to feed her. It took one person to hold her head, and another the arms and legs, while a third fed her. She also had to be tied down, as she threw herself out of bed. She was continually gnashing her teeth, and had bitten a piece off the feeder, and was then fed from a medicine bottle, a baby's bottle not succeeding. She was so bad at 6 P.M. that she had ten grains of chloral given her, and at 7.40 P.M., ten grains each of chloral and bromide, and this was repeated at 12.10 P.M.; but before this she was put twice under the influence of chloroform, the effects of which did not last more than twenty minutes each time. At 1.20 A.M., being very bad, she was again put under chloroform, and while under its influence one-sixth of a grain of morphia was injected hypodermically. This kept her much quieter for two or three hours, and during the night she had two more doses of the chloral and bromide. Ordered four ounces of brandy in addition to four ounces of port. She took about a pint and a half of milk during the day, and a little beef-jelly. Faradisation to be discontinued.

22nd.—She was put twice under the influence of chloroform this morning, but she is by no means so violent as yesterday. Has taken the chloral and bromide every three hours.

23rd.—Rather better, but still throws herself about very violently. She did not recognise her mother.

24th.—Yesterday she took four doses of the chloral and bromide. She is better; still very difficult to feed her. She takes plenty of milk and some beef-jelly, as well as her wine and brandy.

25th.—Much better. Much less difficulty in feeding her. Ordered chloral and bromide three times a day.

April 26th.—Can manage to swallow some bread and milk. Shakes hands tolerably well; she could not manage this at all two days ago. Passes her motions and urine naturally.

27th.—Still improving. A penny was held above her head, and she was told to try and get it; she immediately secured it.

28th.—Shakes hands very nicely, and takes her food very well.

31st.—Still improving. On setting her up in bed she threw herself about for a minute or two in something like her old style, and then became pretty quiet. Pulse stronger. Ordered to continue the chloral and bromide, and in addition to take the iron and arsenic mixture of the 17th.

May 3rd.—Improving rapidly. Has for two



days been able to feed herself nicely, and can manage to sit up in bed pretty well.

8th.—To discontinue chloral and bromide.

10th.—Early this morning she got up and dressed, and was, to the surprise of all, able to walk very decently. She still has slight choreic movements, especially of face. Ordinary diet; to discontinue brandy; port two ounces.

14th.—Walks very nicely; can manage to walk up and down the ward, keeping on one board.

23rd.—She went out to-day perfectly well, with the exception of occasional slight choreic movements of hands when under the influence of any excitement.

### CARDIFF INFIRMARY.

POPLITEAL ANEURISM; LIGATURE OF FEMORAL WITH CARBOLISED CATGUT; CURE.

(Under the care of Dr. SHEEN.)

WILLIAM R—, aged thirty-six, laborer, was admitted into the infirmary on May 23rd, 1876, suffering from aneurism in the right popliteal space and great oedema of the leg. He stated that he first felt a cramp in the back of the knee, with shooting pain down the calf, about nine weeks before admission, which he was unable to account for. He had only a few days previously been discharged from the Bristol Hospital, having suffered from a compound fracture of the lower jaw, which was not quite healed when he entered the infirmary. He stated that he had a blow on his leg when he fractured his jaw in March, but he could not remember anything further about it. He had to give up work four or five weeks ago on account of the pain and swelling in his leg. Measurement: Right knee, 18½ to 19 inches; left knee, 15 inches. Carte's tourniquet was applied, but was given up in a week, owing to the treatment not being efficiently carried out.

On June 9th (seventeen days after admission) the diameter of the right knee was about half an inch greater. The femoral was tied about the apex of Scarpa's triangle, which lay very deep, owing to a thick layer of superficial fat. The greater part of the operation was done antiseptically, until the apparatus slipped out of the assistant's hands on to the floor. The carbolised catgut ligature, which has been used for some years at the infirmary, was used in this instance with perfect confidence in the result, as there has never been an accident with it yet at the infirmary. No chloroform was given. The edges of the wound were brought together with silver-wire sutures, and a drainage-tube having been inserted, the wound was covered with antiseptic gauze and bandage, and the whole limb enveloped in cotton wool.

June 11th (third day).—Limb cold for some hours after the operation, but got warm about five P.M. Wound dressed to-day for the first time, antiseptically. No redness; slight sero-sanguinolent discharge; no smell. Line of incision healed except at lower part. Drainage-tube cleaned and replaced.

13th.—Dressed again; scarcely any discharge; no pain.

18th.—Wound completely healed; stitches taken

out; drainage-tube dispensed with. There was not the slightest rise of temperature throughout, and the patient's diet was never changed.

28th.—Swelling much decreased, and whole leg and tumour much more supple. No pulsation in latter. Sensation at toes not so good as in other foot, but is improving rapidly. Measurement at knee, 17 inches. To get up and move on crutches.

July 18th.—Doing well. Made an out-patient.

*Remarks by Dr. SHEEN.*—The chief interest of this case is the use of the carbolised catgut ligature. About six months ago Mr. Holmes brought forward a case at the Clinical Society, and the question of the use of the carbolised catgut ligature was very fully discussed. In the tying of all vessels at the Cardiff infirmary we have used nothing but this ligature for several years, and the few cases we have had of tying vessels in their continuity have done remarkably well. By the courtesy of my friend and colleague, Dr. Taylor, I am enabled to mention two cases which were under his care, and which did well.

1. M. B—, aged forty. Popliteal aneurism. Admitted March 19th, 1873.—March 21st: Tourniquet applied.—April 21st: Carbolised catgut ligature, and ends cut off. Wound healed by first intention. [This case was treated in a tent in the infirmary grounds.]

2. W. B—, aged thirty-eight, admitted Dec. 21st, 1875.—Dec. 29th: Similar operation.—Jan. 22nd, 1876: Discharged cured. This man had been treated by pressure in a Cork hospital some years before, and had a deep scar the size of a five-shilling piece directly over the femoral artery, which could be felt pulsating just beneath.

Both these were very interesting cases.

It is surprising to see how curiously our text-books speak of the catgut ligature. Surgeons in all parts of the country doubtless use the catgut ligature in the treatment of aneurisms, and yet Bryant, in his second edition, published within the last few months, scarcely mentions it. Chloroform was not given in this case. Bryant states, "it need hardly be said that chloroform should always be given in these cases." But this is really not necessary. The first incision is the only painful one, and if a patient have a fair amount of courage I should not be inclined to give chloroform unless a decided wish to have it was expressed.

It seems only reasonable to suppose that a trial of the treatment by pressure for some days, though it fail to cure the aneurism, should facilitate the establishment of the collateral circulation after the operation of applying a ligature to the main vessel. I think I have seen it so stated in surgical works. And yet Mr. Holmes tells us, in his lectures delivered before the Royal College of Surgeons in 1874, that the mortality in such cases is greater than in those where the ligature is applied without any attempt at treatment by pressure.

### GREAT NORTHERN HOSPITAL.

REMOVAL OF NECROSSED PATELLA.

(Under the care of Mr. GAY.)

THE operation for the removal of the necrosed patella has very rarely been performed. The first recorded instance seems to have occurred in the

practice of M. Thirion, of Namur, in 1829. The details of that case may be found in one of the early numbers of this journal (vol. xviii. 1829). The patient recovered with a useful limb. Dr. Gross, of Philadelphia, some years ago, gouged away nearly the whole of a patella that had suffered necrosis from frost-bite; and in 1860 Dr. O. B. Knöde, of Missouri, removed the whole patella for necrosis, after a fall. In both these instances a useful limb was obtained. Another case was recorded by Dr. Kelly, in the twenty-second volume of the Pathological Transactions. It was under Mr. Wood's care at King's College Hospital. This appears to have been caused by pyæmia of the knee-joint a fortnight after a punctured wound of the forefinger by a dirty fork in a girl aged seven. The joint was freely opened, and after six weeks the patella was found loose on the surface of the wound, and was removed. Mr. Stanley does not allude to the subject in his excellent work on the Diseases of Bones.

Jessie C—, aged thirteen, when admitted on the 5th of June, was anæmic and thin, and had been the subject of rickets; the tibiae, especially the right, being considerably curved, as usual, forwards. Little could be obtained about the history of the case. Her mother stated that she had always been weakly. She had had chronic sores on the nates and axillary abscesses when two years old. About January last, the right knee became painful, red, and swollen. An abscess formed over the patella, which broke spontaneously; the opening enlarged, and the surface of the patella gradually extruded.

On admission, the patella was found necrosed, with matter oozing from the contiguous soft parts. The joint was extended, and extremely painful both on pressure and on the slightest attempt at flexion. When moved, a sense of extensive creaking or crackling was perceptible within the joint. The child was in a very low condition, and it was deemed desirable to do something surgically without delay in order to save life.

Mr. Gay determined on removing the patella. This was done on June 14th. On the removal of the bone, the joint appeared to be full of red granulation-tissue, upon which the under surface of the patella rested, and to which it was somewhat adherent. It completely obstructed any view of the interior.

The limb was placed on a back splint and slung. Not a single bad symptom followed. The wound healed, and by the middle of July the girl was up and about. There was considerable movement of the joint without pain, and all creaking sound had ceased. By the latter end of the month she began to walk about with the assistance of a stick. She will probably recover the use of her limb to nearly the same extent as those in whom fracture of the patella has issued in union with extensive separation of the fragments.

There was no history in this case from which the immediate cause of the necrosis could be inferred; no blow or other local or special constitutional injury other than the struma referred to. The bone perished, and the abscess formed in order to effect its release. The bone was small, and the cancellous cells large, but without any signs of their having been subjected to an attack of osteomyelitis. It is probable that the necrosis in this case was due to direct injury and low vital power.

The bone was bare excepting at its articular

surface, from which the cartilage was in the act of being removed. At the centre it had been removed over a considerable space, exposing its cancelli. And this removal had obviously been effected by absorption through the medium of the red granulation-tissue referred to, and such as is found around articular joint disease in close connexion with the borders of the cartilage, in cases where this is undergoing removal. This tissue occupied the entire supratellar region of the joint, and was attached to the bare bone, but not to the surface of the adherent cartilage, so that the absorption was taking place at the edge and not at the superficies. The absorption, too, was complete, for there was neither débris nor pus on its surface when the bone was uplifted. This tissue appears to have been itself absorbed after the removal of the bone.

## Editorial.

### THE DUALITY OF THE VASO-MOTOR SYSTEM.

ONE of the most important results of that experimental physiology which it appears is now to become part of the function of the State to control, if not to hamper, has been the discovery of the vaso-motor system of nerves. This discovery, and the famous experiments that led to it, are now as well known as any of the most elementary facts in physiology, and its results in the elucidation of many a pathological problem cannot even yet be said to have reached their final completion. Nor even, as regards the physiological question itself, has research exhausted this field; many questions regarding the operation of the vascular nerves, and the precise locality of their medullary centre, are still open for investigation. There has, however, of late years been introduced an important modification, or rather extension, of the primary views of the operation of this system of nerves.

The doctrine of inhibition and inhibitory nerves is dying. The most cursory glance over the modern tendencies of physiological research is sufficient to show this. Interesting as an hypothesis, and for the most part sufficient to explain the phenomena of vascular dilatation under irritants, or on excitation of sensory spinal nerves, inhibition has failed to explain all the facts which modern science has brought to light. It remains to be seen whether the alternative hypothesis has a surer basis, as it is of wider application. Indeed, it is hardly fair to style it hypothetical, for it is adduced as fact, and much experimental proof has been detailed in support of it.

This substitute for the doctrine of inhibition may be summed up in the phrase "the duality of the vaso-motor system." It considers that all the

vascular nerves may be resolved into two mutually antagonistic sets—the constrictor nerves and the dilator nerves,—the normal tonicity of an artery being due to the balance kept between these two vaso-motorial agents. If that balance be destroyed, the part supplied by the vessel becomes either hyperæmic or anæmic, according as the dilating or contracting power has the upper hand. Thus, whereas on the theory of inhibition vascular dilatation was a passive process—a suspension of the usually operating vaso-motorial influence or state of contraction of the vessel, on the present view there is held to be as much action about the dilatation of an artery as there is about the narrowing of its calibre. The grounds upon which the fact of “active dilatation” of arteries is based are numerous. It has been shown that the dilator nerves take their origin from the cerebro-spinal axis. Some of their fibres accompany the chorda tympani, irritation of which causes an active determination of blood to the submaxillary gland—a phenomenon hitherto explained on the well-known inhibition view. The opacity of the cornea and inflammation of the conjunctiva that follow section of the fifth cranial nerve on the central side of the Gasserian ganglion, without the peripheral nerve-fibres leading to the inflamed part degenerating, are explained by the assumption that the fifth pair contains dilator nerves, which in the normal state of things counterbalance the action of the constrictor nerves. The ocular disturbances are thus attributed to the uncontrolled action of the latter kind of fibres, and, in support of this, it is said that there is notable narrowing of the vessels of the face on the side of the lesion. The most convincing fact of all in support of the presence of a set of vaso-motor nerves which actively dilate bloodvessels is contained in the experiments of Schiff. He has found that all erectile organs are supplied by nerves of which the stimulation is followed by an increased flow of arterial blood into the erectile tissue. The existence of these *nervi erigentes* is now pretty generally accepted, but it has hitherto been rather regarded as an isolated fact, and one peculiar to the special organs in question.

The eminent physiologist Claude Bernard has fully adopted the dual view of the nature of the vaso-motor system, and has, in his recently published work on Animal Heat, very clearly generalised upon the subject. He admits that the precise *modus operandi* of active vascular dilatation is as yet unexplained, but, fully adhering to the belief in the existence of vaso-dilator nerves, he dignifies them with the name of “calorific,” as distinguished from the vaso-constrictor or “frigorific” nerves. When the action of the former predominates, the blood-flow to the part is increased, and with it necessarily occur increased oxidation and disintegration of tissue. There may be here found

some explanation of abnormal temperatures following certain spinal injuries, when the vaso-dilator “centre” can be established. M. Bernard would assign the phenomena of fever to the preponderating action of vaso-dilator nerves, and he points out that as the febrile process *per se* is a source of danger to life, so the aim of therapeutics should be to combat the source of this and control the undue action of calorific nerves. Such an object is attained by the external application of cold, which is one of the most certain and powerful means of subduing fever.

There is, however, one objection—an *a priori* one it is true, but still valid—to the doctrine of vaso-dilator nerves. It is conceivable enough that arteries, in a state of tonus, are kept semi-contracted by special vaso-motor nerves, and that, on the withdrawal of that influence, they should dilate. That, however, is only the doctrine of inhibition. The very phrase “active dilatation” implies something more; and surely when we speak of special “calorific nerves,” which play an important part in the production of fever, we suppose there are agencies which can cause bloodvessels to dilate beyond their normal calibre, and in their whole extent. That it is impossible for bloodvessels to undergo this change by the action of their muscular walls it would be rash to assert, but it is almost inconceivable; and until it is fully explained the theory of active dilatation of bloodvessels, and therefore the duality of vaso-motor nerves, must be held under considerable reserve. The difficulty is, however, only based on *a priori* grounds, and probably the physiologist could afford an easy and satisfactory solution to it.

## INVESTIGATIONS INTO THE STRUCTURE OF THE PLACENTA.

THE complex structure of the human placenta, the difficulty associated with the investigation of its anatomy, and the mystery surrounding every step in the process of the generation of a new being, have directed more than usual interest to this organ. The structure of the fully-matured placenta, however, is of so intricate a character that, but for the study of the anatomy of the organ in the lower animals, it would hardly be possible to unravel it. For a long time it has been believed that at an early period of gestation the villi of the chorion entered into and ramified in the glands of the thickened mucous membrane of the uterus. It is also believed that the mucosa uteri became interlocked in a very intricate manner with the aborescent chorionic villi, and that a large system of sinuses was formed in the maternal portion of the placental vascular system, into which the uterine arteries poured their blood, and from which

the uterine veins carried it away. Into these sinuses the vascular villi of the chorion project, and the tissue separating the maternal blood from the chorionic villi and their contained vessels is of extreme thinness.

The recent investigations of Ercolani, and of Prof. Turner of Edinburgh, confirm in part the above view of the structure of the placenta. The researches of Prof. Turner are of special value, inasmuch as they extend into all known forms of placenta; and the lectures delivered by him at the Royal College of Surgeons give a description of the organ from its most simple form to the most complex. He shows that the simplest form of placenta consists of a vascular loop of the chorion received into a vascular recess in the decidua. The vessels are in apposition and separated by a thin layer of connective tissue and a layer of secreting and of absorbing cells. By the modification and multiplication of such a vascular loop and recess, and of their individual elements, modifications in size, shape, complexity, &c., the most complex placenta is formed.

The vascular loop is the chorionic villus; the vascular recess into which it is received is not the utricular gland, as was once believed, but a distinct structure formed anew during gestation. It is a crypt varying in shape in different animals, lined by the columnar epithelium of the inner surface of the uterus. As the villi grow longer and become more branched, the crypts grow deeper and subdivided. The glands open on smooth surfaces of mucosa. When the villi have become attached to the crypts, the surface layers of the mucosa uteri grow up between the villi, covering each of their branches and stems as far as the chorion itself. These laminae of maternal tissue which enter the placenta are highly vascular, and carry the maternal vessels up to the surface of the chorion. These vessels are, in the simpler forms of placenta, as the diffused and polycoty-ledonary, simple capillaries, but in the carnivora they begin to form distinct though small sinuses close to the chorion. This is the earliest trace met with of the intra-placental blood-vascular sinus system. This is seen in a higher degree of development in some specimens of the bell-shaped and discoidal placenta. In some forms of the latter, however, the maternal vessels retain the form of capillaries. In the human placenta this blood-vascular sinus system attains its maximum of development. Professor Turner found in a human uterus of about a month's gestation the capillaries of the maternal mucous membrane at the site of the placenta dilated into large sinuses. This was in an un-injected specimen. Though objections have been raised to inferences as to the structure of the placenta drawn from the results of injection, on account of the extreme delicacy of the vascular walls, and consequent liability to rupture during

the process of injection, yet as the results found after injection are uniform, and also in accordance with what comparative anatomy teaches, the value of these objections is much diminished; and, on the other hand, that of the inferences derived from injection is enhanced. Not only do the results of injection of the human placenta point to a blood-vascular sinus system, but on placing a placenta in water, and opening the so-called circular sinus, distinct openings can be seen in the walls of that vessel, and through these openings the villi can be distinguished, and in some cases the villi even pass through these openings into the canal of the circular sinus itself.

In the placenta itself, or the serotina, glands appear to be scanty. They usually open, not into the crypts of the mucosa, but on ridges, or smooth portions of membrane intermediate between the crypts. These ridges or smooth parts of the decidua are apposed to non-villous and less vascular spaces of the chorion. In the human placenta glands doubtless open, in the early periods at least, on the surface of the serotina. In the lower animals, however, with a few exceptions, glands, though seen branching in the connective tissue beneath the crypts, were not seen opening into the crypts, and consequently their secretion did not come into immediate contact with the chorionic villi.

The elaborate researches of Professor Turner into the comparative anatomy of the placenta, as well as those of Prof. Ercolani, of Bologna, support the general view of structure of the placenta known as the Hunterian. They, however, are opposed in several particulars to the view of the development of the organ which has for a long time been accepted, especially the part played by the glands and villi. These researches have placed the Hunterian view of the placenta on a new basis—that of comparative anatomy, for never before had the minute structure of the various forms of placenta been carefully studied and compared.

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## SPLENOTOMY.

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EXPERIENCE of Splenotomy has done little hitherto to lighten the opinion of its gravity which our knowledge of the anatomy and physiology of the spleen suggests. It must still be regarded as one of those operations the hazard of which is almost prohibitory. In the hands of K  chler, Spencer Wells, and K  berl   it has been unsuccessful. A break in the uniformity of the failures may serve to encourage those who, in spite of failure, still regard the operation as probably feasible. On the 18th July last M. P  an presented to the Acad  mie de M  decine two patients on whom

he had performed the operation with complete success. One of the cases was operated on in 1867, and subsequently presented to the Académie in good health. The second patient has just recovered. The details of the case and of the operation are of great interest. The patient was a married woman aged twenty-four years. A history of miscarriages and dead children was strongly suggestive of syphilitic taint. A splenic tumour had been observed steadily increasing for eighteen months. In February the tumour filled almost the whole abdominal cavity; it extended to the pelvis and even to the right iliac fossa. Various symptoms, apparently secondary to the tumour, distressed her, and the abdominal pain was constant. The patient implored an operation, which was performed on the 25th of April. An incision was made along the linea alba from three inches above the umbilicus to two inches and a half above the pubis, and a corresponding incision was made through the peritoneum. The tumour was covered by the omentum; this was removed from below upwards, and pushed to the right of the tumour, beneath the right hypochondrium, and both it and the intestines were kept back by sponges and warm napkins. The tumour had the characteristic reddish-violet color of the spleen. It was seized at its lower extremity, and gradually raised within the lips of the wound, until it rested on the hands of the assistants who were keeping back the intestines. No other organ escaped. The gastro-splenic omentum was about three-quarters of an inch wide at the level of the hilus; it contained bloodvessels and enormous lymphatics. One splenic vein was the size of the index-finger. A wire ligature was passed round the whole pedicle, great care being taken to avoid the pancreas. The pedicle was then surrounded by sponges, and the spleen separated at the hilus by a single cut, being at the same time turned quickly outwards. About a quart of blood escaped in a jet from the spleen, but none fell into the abdomen; otherwise not more than thirty grammes of blood were estimated to be lost. No adhesions were met with. The sponges were removed, the great omentum spread out over the intestines, and the abdomen closed, the pedicle being retained between the lips of the wound. The progress of the patient was excellent. The febrile reaction was slight. Some blood appeared in the urine on the third day, but diminished and disappeared a few days later. The pedicle separated in a week. The patient's spirits were very good. Eighteen days after the operation she sat up, and a week afterwards returned home.

We congratulate M. Péan on so brilliant a success. It is to be remarked that the patient would appear to have been free from grave constitutional disease, such as leucocythæmia, from which some of the cases operated on were suffering, and which

must very much have prejudiced their chance of recovery. M. Péan has shown conclusively that splenotomy must no longer be regarded as an operation absolutely mortal. A careful selection of cases may no doubt be necessary. In this case the morbid state of the spleen was one of simple hypertrophy, and the mental and physical condition of the patient appeared in every respect favorable.

## Medical Annotations.

"Ne quid nimis."

### SUNSTROKE.

Dr. HORATIO C. WOOD, whose excellent monograph on sunstroke, or thermic fever, published a few years since, must be familiar to a large number of our readers, has an instructive article on the disease in the *Philadelphia Medical Times* for August 5th. We regret that we cannot do more than skip lightly through it. Dr. Wood has been in medical charge at the Centennial Exhibition, and also on duty at the city hospitals during the recent unprecedentedly hot weather, and has been able to supplement his experimental knowledge of sunstroke with clinical observations. It may be remembered that the result reached in Dr. Wood's book was that there are two distinct classes of cases, which have been confounded under the name of sunstroke. In the one the patient is collapsed, in the other the bodily temperature is excessive. Two cases—one of each sort—which came under treatment at the Centennial are described. In the former there was a temperature as low as 95½° F., and in the latter it rose to 108° F. In the two cases unconsciousness was developed with equal suddenness, and was accompanied by a similar delirium. Dr. Wood thinks it probable that in the collapse there is more than simple syncope; that lowered temperature, like elevated temperature, paralyzes the nervous matter, which has been so constituted as to perform its functions on a certain caloric level.

Dr. Wood thinks that the possibility of children having slight attacks is greatly overlooked, and has little doubt that many of the cases reported as cholera infantum, enteritis, &c., are really instances of thermic fever and are curable by treatment as such. Cases of this character usually owe their cerebral symptoms either to intense exhaustion, to be treated by stimulants, or to intense fever, to be treated by cold baths. Referring to a paper by a colleague on the cold-bath treatment of infantile diarrhœa, Dr. Wood says: "Anyone who has seen, as I have this summer, the child on whom drugs had ceased to act and who was seemingly doomed to die, relieved in twelve hours by enforced cold bathing every three or four hours, will grant to Dr. Comegys the credit of having introduced one of the most life-saving improvements in infant therapeutics. The sudden sweet sleep replacing after the bath the fretful nights and days of unrest is a thing never to be forgotten when once seen, and the arrest of diarrhœa is cer-

tantly no less remarkable." As regards the treatment of thermic fever the early use of the ice-water bath is advocated, the bath being used just long enough to reduce the mouth or rectal temperature to 100° F. and no longer. After the bath Dr. Wood has found the hypodermic injection of quinine of great service in preventing a rise of temperature. With the subsidence of the first symptoms, headache, slightly increased heat, general distress, and sometimes mental incoherency, supervene. These Dr. Wood believes to be due to a low grade of meningeal or even cerebral inflammation. He has found them yield in some cases very rapidly to free blistering of the back of the neck and head aided by small repeated doses of mercurials. One great cause of the excessive mortality from sunstroke in hospital practice is recognised in the length of time that elapses between the onset of the disease and the use of the bath. In the Philadelphia hospitals and ambulances measures have been taken to obviate this danger.

#### M. PASTEUR UPON THE EXPERIMENTS OF DR. BASTIAN.

A COMMUNICATION recently made by Dr. Bastian to the Paris Academy of Sciences upon the Influence of Physico-chemical Forces upon the Phenomena of Fermentation has met with a prompt reply from M. Pasteur (*Comptes Rendus*, July 17th), in a note on the Changes undergone by Urine, in which he points out what he considers to be errors in Dr. Bastian's experiments, which he has himself repeated. In his opening remarks, he contrasts the supporters of spontaneous generation with the theorists in physics and mathematics who believe in perpetual motion or in the quadrature of the circle; and he thinks that the only reason why heterogenists are listened to at all is because of the impossibility of proving *a priori* the origin of life except from life—in other words, because biology is not yet an "exact" science. Turning to Dr. Bastian's paper, he singles out for especial comment those experiments in which bacteria appear in urine mixed with oxygen and solution of potash, and kept at a temperature of 122° F. (50° C.), the urine having been previously boiled, and all precautions taken to withdraw it from any source of contamination by atmospheric germs. M. Pasteur admits that Dr. Bastian's experiments are very exactly carried out, but he contends that a temperature of 50° C. is not sufficient to kill all the germs of minute organisms which may be introduced into the urine by means of the solution of potash. In his memoir, published in 1862, and entitled "*Sur les Corpuscles organisés qui existent dans l'Atmosphère: examen de la doctrine des Générations Spontanées*," he showed that acid liquids which are rendered sterile after a few minutes' exposure to a temperature of 100° C. remain fertile when made slightly alkaline; and he considers the precaution adopted by Dr. Bastian, of further heating the fluid to 50°, to be superfluous. He considers it fully proved that the germs of certain organisms which do not resist a temperature of 100° in acid solutions, are capable of such resistance in neutral or slightly alkaline fluids. In the latter case, in order to effectually destroy all germs, the solutions must be heated above boiling point—e. g., to 110° C. He therefore recommends Dr. Bastian to repeat his experiments

with the additional precaution of adding solid caustic potash previously heated to redness or to a temperature of 110°, instead of employing the alkali in aqueous solution; or simply to heat the urine and liquor potasse to 110° instead of 100°. M. Pasteur has found that perfectly normal urine rendered alkaline by a piece of solid potash undergoes no change when due precautions are taken to get rid of the contact of the atmospheric germs; and, in conclusion, he expressed the hope that Dr. Bastian would abandon his faith in spontaneous generation and in the proofs which he thinks he has given of it. At the same meeting M. Pasteur related observations showing that the urine of a healthy man is free from germs, but in the majority of cases it meets with different kinds of germs at the orifice of the urethra, or in the air in the neighborhood, during its emission. He also described the very simple apparatus which he had employed in repeating Dr. Bastian's experiments, in which he was aided by M. M. Joubert and Chamberland.

#### THE CAUSE AND TREATMENT OF RICKETS.

DR. NORMAN MOORE, in a thesis for an Act for the degree of M.D. in the University of Cambridge, has made some interesting observations, which are evidently the result of much study and consideration of this subject. The author accepts Sir William Jenner's definition:—"Rickets is a general disease, manifested by certain lesions of the structure of the bones," and then proceeds to give a short account of the disease, drawn exclusively from his own observations. The earliest age at which he has seen rickets is ten weeks, the latest at which it seemed to begin twenty-two months. It most often attacks children while cutting their teeth, or just before they cut them, and usually causes pain at its commencement. It is a disease of indefinite length. Rickets rarely causes wasting. Out of 200 cases tabulated by Dr. Moore, there was wasting in eight only. From the observation of these 200 cases, he is led to the opinion that the main cause of rickets acts through the digestive system, and is improper feeding. The child is suckled too long or fed too soon. Bad air, want of cleanliness, ill-nourished parents, may no doubt be presumed in some of the cases, but by no means in all, nor even in the majority; for the out-patients of the Children's Hospital in Great Ormond-street are often better to do than those of other hospitals. The cause of rickets is not to be found in the wealth, the poverty, the nationality, the age or diathesis of the parents; nor can it be considered a result of previous acute or inherited disease of the children. Dr. Norman Moore adds an argument from animals. He says that Dr. Harris, of Gonville, and Caius College, had a few years ago some beagle pups which were fed soon after birth on dog biscuits. Their legs were noticed to become bent and their joints enlarged. There were well-marked beads to be felt on their ribs. The administration of cod-liver oil cured them. A somewhat similar result followed in the case of a young hen-barrier, taken by our author from its nest in the heather, in the summer of 1874, brought to London, and fed on beef, with now and then a bird. It ceased to thrive; did not emaciate, but became feeble. Its leg-bones were soft, and after death could be slightly bent. The

first point, of course, then, in the treatment of rickets is the regulation of the diet. If past eight months old, the child must be weaned; if younger, and fed on solids, it must be given a nurse or fed on cow's milk mixed with a little water, or preserved milk. The next point is the administration of cod-liver oil. In treating the complications of rickets, the treatment should be general, and not symptomatic. Laryngismus stridulus is pointed out by our author as pre-eminently the nervous disorder of the rickety constitution, just as chorea is the nervous disorder of the rheumatic constitution.

#### OSSEOUS LESIONS IN INFANTILE SYPHILIS.

In a recent number of the *Archives de Physiologie*, M. Parrot briefly sums up the results of his observations into the condition of the osseous system in infantile syphilis; maintaining the lesions described to be among the most constant of any of the manifestations of that disease. Starting sometimes in intra-uterine life, they occasionally do not appear until some days, weeks, or months after birth. These affections are grouped by M. Parrot under four heads, according to the degree in which the bones are involved. The long bones of the limbs, scapula, ilium, and the cranial bones, are those which most frequently suffer; the ribs, clavicles, metacarpal and metatarsal, and lastly the vertebrae, are more rarely attacked. The lesions are always symmetrically disposed. Those of the *first degree* are observed in the fœtus or in children dying a few days after birth. The affected bones are covered by a layer of osteophytic growth, which in the long bones is sometimes so great as to give the bone double its normal diameter. There is thickening also of the epiphysal cartilage. In the *second degree* the layers of new bone are less compact, and are limited usually to the lower extremity of the shaft of the humerus, the upper end of the radius, anterior surface of femur, and inner aspect of tibia. At the same time, the cancellous tissue undergoes a gelatiniform atrophy, which begins in small centres of softening of a yellowish or reddish-yellow color; the process extends later to the compact tissue, and last of all invades the layer subjacent to the epiphysal cartilage. The syphilitic pseudo-paralysis of the newborn is due to this osseous degeneration. The *third degree* occurs in older infants. It is marked by a sort of hypertrophy of the medullary substance, which encroaches on and finally replaces the osteophytic production of an earlier date. It is most marked usually in the lower third of the humerus. The *fourth degree* is characterised by the appearance of spongy tissue at the periphery and extremity of the shaft of the bone. Occurring in infants more than six months old, the lesions may pass into and be mistaken for those common to rickets. The rachitic changes, however, are never met with under six months of age; whereas it is just in those earliest periods of infantile life that the osseous changes of hereditary syphilis are most marked.

#### THE PHYSIOLOGICAL EFFECTS OF COMPRESSED AIR.

THERE have been many observations of late upon the effects produced on the functions of the body

by long immersion in compressed air; and the efficacy of the compressed air bath in certain pulmonary affections is held deservedly in high repute. Most of the observations on the subject have been made by M. P. Bert, of Paris, who supplemented his previous researches by a note read at the last meeting of the Société de Biologie. He pointed out that the mechanical effects of compressed air were to cause lowering of the diaphragm and liver, and a consequent increased pulmonary vital capacity—an effect gradual in its production, but lasting long after the subject is withdrawn from the condensed atmosphere. Other experiments have been made by M. Pravaz, of Paris, and Drosdorff, of St. Petersburg. The former finds that the heart's action is at first increased and then lessened; the pulse first becoming more rapid and then slower, but never falling below the rate at the normal atmospheric pressure. The respirations are diminished during the immersion, but on removal of the increased pressure they rise in frequency, and in direct proportion to the degree of compression of the air. There is an increase in the amount of urea excreted, but this increase diminishes the longer the sojourn in the compressed air. There is at the same time an increase in the amount of carbonic acid expired. The temperature of the body rises above the normal at first, and then falls as the immersion is prolonged. These varying effects are due, M. Pravaz thinks, to the two influences of inward atmospheric pressure and hyper-oxygenation, the former tending to diminish the circulation and the organic changes, and the other to increase them. He agrees with Waldenburg that there is a lessening of arterial tension under these conditions, but herein he differs from M. Drosdorff, who has found—first, that the inspiration of air at a low degree of compression (one-sixth atmosphere) raises the negative pressure of the thorax, and thus lowers the blood pressure in the aortic system; secondly, inspiration of air at a higher degree of compression induces active expansion of the lungs, and diminishes the negative intra-thoracic pressure, whilst lowering the expiratory power of the thorax, and hinders the passage of the blood from the veins into the arteries; hence a diminution in the arterial pressure.

#### DEGENERATION OF NERVES.

AN essay on the degeneration of the nerves when separated from their trophic centres appears in a late number of the *Archives de Physiologie* (No. 5, 1875), by MM. A. Cossy and J. Dejerine. These experimenters have employed the sciatic nerve of guinea-pigs as the subject of their observations, the nerve being examined daily up to the nineteenth day after its section. They corroborate the statements of Longet, to the effect that the excitability of the peripheric segment is greatly lowered on the second day after the operation, and after the third day is almost entirely lost. They also corroborate the statements of Ranvier in regard to the structure of the nerve, except that they have never been able to satisfy themselves of the presence of a protoplasmic layer between the medullary layer and the sheath of Schwann. MM. Cossy and Dejerine find that the degenerative processes in the peripheric portion of the divided sciatic take place with much greater rapidity in the fine primitive fibres than in those of larger calibre,



which form the great majority in this and other mixed nerves. After the lapse of three days, at a time therefore when the physiological degeneration is already completely expressed, no other changes can be demonstrated than that the axis-cylinder is abnormally friable, and that the nuclei of the sheath of Schwann are very slightly swollen. There is certainly not at this time the great swelling and enlargement of these nuclei to which Ranvier is inclined to attribute the suppression of the physiological excitability of the nerve. The swelling of the nuclei noticed by Ranvier commences after the fifth day with the well-known changes in the medullary sheath. About the twelfth day the axis-cylinder has entirely vanished in all the fibres. From these observations the authors conclude that in the degeneration of nerves divided from their centres, the axis-cylinders are first affected, becoming fragile and losing their continuity. The enlargement of the nuclei and the changes in the medullary sheath they regard as only of a secondary nature, and are not the cause of the loss of functional activity of the fibres. The authors are therefore inclined to attribute, with Waller, a positive nourishing and maintaining power to the trophic nerve-centres, and not, as Claude Bernard and Ranvier believe, an inhibitory influence.

#### PURPURA HÆMORRHAGICA.

At a recent meeting of the Biological Society of Paris M. Hayem related the following interesting case:—The patient, a cook, thirty-two years of age, after a period of malaise lasting fifteen days, was attacked with numerous cutaneous hæmorrhages, with epistaxis, slight in amount but frequently repeated, a bloody discharge from the right ear and from the gums. As the patient became daily weaker, and his anæmia more pronounced, M. Hayem had recourse to transfusion. This produced a temporary amendment, but the graver symptoms recurred, delirium supervened, and the patient succumbed. The temperature, which, at the commencement of the illness, ran a very irregular course, rose after the transfusion, and again during the last days of life. Examination of the blood made during life showed a slight excess in the number of red corpuscles, and a large number of white elements, which differed, however, from leucocytes in being of the size of a red corpuscle and in displaying clearly a pale, finely-granular nucleus, containing a well-defined nucleolus. Others, larger than normal white corpuscles, contained numerous nuclei, embedded in a protoplasmic investment. At the autopsy the spleen was found to be of very large size; the liver discolored and yellowish in places; the kidneys pale and yellowish; there were submeningeal effusions of blood, and black patches on the surface of the convolutions. Microscopical examination of the cutaneous petechiæ showed proliferation of the cells of the lining membrane of some of the arteries, the artery supplying the centre of the hæmorrhagic spot being completely blocked by clot, in which the desquamated cells were imbedded. Similar changes were found in the arterioles of the meninges and of the brain. M. Hayem remarked upon the similarity between these alterations and those which he had found, in conjunction with M. Vulpian, in the anæmic patches and

miliary abscesses of septicæmia. He thought then that Worloff's disease (purpura hæmorrhagica) was allied to septicæmic infectious diseases, with grave alteration of the blood.

#### THE INFLUENCE OF PHTHISIS UPON CHILD-BEARING.

AMONGST the numerous theses sent in this year for the Doctorate of Medicine of the Faculty of Paris is one by M. F. Ortega upon the above subject. The essay is fairly summarised in the *Revue des Sciences Médicales*, and the following are amongst the chief conclusions arrived at by the author, as a result of investigations in ninety-five cases. Phthisis has in the first place a marked effect upon conception; thus the author only met with thirteen out of his ninety-five females who, after the commencement of pulmonary symptoms, bore more than one child, and a third pregnancy was very rare in such circumstances, although many of the women were multiparæ. In all these cases the phthisis was in the first and second stage, in one only it was advanced. In this case there was an abortion at the fourth month, and death shortly after. As to pregnancy, more than one-third of the cases aborted or were premature deliveries, and reckoning only those who had a tubercular history, in but one-half did the pregnancy last till full term. Phthisical mothers are moreover unable to suckle their offspring, for setting aside ten cases in which phthisis developed during and probably under the influence of lactation, only eleven out of sixty-four infants were suckled by their mothers, and these infants, healthy at first, soon showed signs of insufficient nutrition, and died with enteritic symptoms. M. Ortega's cases show also that pregnancy hastens the evolution of phthisis to a marked extent, delivery being rapidly followed by the death of the mother, although the first days of the puerperal state are generally marked by a considerable abatement in the pulmonary symptoms. Both pregnancy and lactation he regards as exciting causes of phthisis in predisposed subjects.

#### LEUCOCYTES.

IN an interesting thesis, M. Henri Bonne has described a series of observations on the proportion of white to red blood-corpuscles in different diseases, made under the direction of M. Brouardel. The examinations were made daily by the methods of MM. Malassez and Hayem. Among the facts recorded are the following. In a patient with cancer of the breast, before its removal by operation, the white corpuscles were 1 to 48 red; three days afterwards they were 1 to 28 and 1 to 23. When suppuration was established the proportion fell to 1 in 60, 1 in 90, and at last, when the pus ran freely, 1 in 400. In two cases of iliac abscess the leucocytes, before the abscess was opened, were 1 to 18 in one case, 1 to 38 in the other. Immediately after, the white corpuscles fell to 1 in 132 in one case, and to 1 in 180 in the other. In other abscesses the same result was obtained. It thus appears that the formation of pus in an abscess coincides with a considerable increase in the leucocytes in the blood, and that the increase disappears when the abscess is opened. Similar re-

sults have been found in other suppurative maladies. In small-pox on the fifth day the leucocytes were 1 in 450; on the sixth day 1 in 48; on the seventh day 1 in 150; on the ninth day 1 in 286. In a case of suppurating pneumonia the white corpuscles at death on the ninth day were 1 to 40 red. Other influences besides confined suppuration cause leucocytosis. An eruption of herpes in one patient raised the number in four days from 1 in 80 to 1 in 90. In typhoid fever the leucocytes are very numerous about the seventh day, but fall to from 1 to 70 to 1 to 500 by the seventh day. Their number does not coincide with variations of temperature.

#### PERSISTENCE OF SENSIBILITY IN DIVIDED SENSORY NERVES.

MM. ARLOING and TRIPIER have recently made some important investigations on the persistence of sensitiveness in the peripheric extremity of divided sensory nerves. They find that this sensibility may be demonstrated in carnivora, solipedes, and rodents. In all instances, and they have found it to exist in the branches of the fifth and in the nerves distributed to the limbs, the sensitiveness of the peripheric end is due to the presence of nerves, the connexion of which with the trophic and perceptive centres has not been interrupted by the section. When these nerves happen to be absent the peripheric extremity of a divided trunk is no longer sensitive. The nerve-fibres in question proceed from the fifth pair, in the case of the facial from the adjoining nerves, and from those of the *opposite side of the body* in the case of the ordinary sensory nerves, and from neighboring and homologous nerves for the nerves of mixed function. The recurrent nerves run up to a variable height in the trunk of the nerve with which they are associated, and their number diminishes in passing from the periphery towards the centre. The loop or point of recurrence of these fibres may take place before the termination of the nerves, but usually occurs at the periphery.

#### NEPHRITIC PAINS IN ATAXY.

DR. MAURICE RAYNAUD has attempted to show that in locomotor ataxy, "nephritic crises" may occur analogous to the "gastric crises" to which M. Charcot has called attention. The statement appears to be based on one case only, which alone is not very conclusive. Its details, however, are of interest. The paroxysms of pain were of great intensity, and were at first separated by intervals of perfect health. Afterwards they were more frequent, but not less intense; and ultimately a state of continuous profound "endolorissement" was reached, with grave general symptoms. The character and seat of the pain, the retraction of the testicle, and the diminution in the quantity of urine, present features closely resembling those of calculous nephritic colic. It is distinguished, however, according to M. Reynaud, by the longer duration of the attacks, lasting six or eight days without intermission; the frequent return of the attacks, which occur during several, even six months; and by an entire absence of those changes in the urine which are so constant in calculus. In the case described, sclerosis of the posterior columns of the spinal cord was found after death.

#### FLUID EXTRACT OF ERGOT IN DIARRHOEA.

A SURGEON in the United States army writes to the *New York Medical Record* to state that he has obtained marked success with the fluid extract of ergot in diarrhoea. He bases the use of this drug on the theory that it causes a contraction of the involuntary muscular fibres, and in so doing relieves the atony of the vessels of the intestinal mucous membrane, and the consequent hyperæmia of the capillaries, and thus prevents the transudation of the watery portions of the blood. In other words, it gives tone to the vascular walls. The writer first tried the drug at the Cincinnati Hospital in the case of a patient with chronic diarrhoea of two years' standing. No method of treatment had been able to reduce the number of his stools to less than eight a day. He was placed on ergot in doses of forty minims four times a day. In about a week the man entirely recovered. While stationed with troops the writer also used it in twelve cases (the number of stools varying from eight to twenty in the twenty-four hours), and in one case only was he obliged to give more than three doses to each case. At the time of the year, when diarrhoea is widely prevalent in this country, the liq. ergotæ, from the account given of it, deserves a trial at the hands of practitioners.

#### INDUCTION OF PREMATURE LABOUR.

THE induction of premature labour is an operation increasingly wanted in practice, and men of large obstetric experience do good service in critically estimating from time to time the value of the respective methods of procedure. Dr. Godeon has published a paper on the subject from the St. Bartholomew's Hospital Reports. After enumerating various methods—puncturing the membranes, the administration of ergot, the injection of water into the vagina, the more dangerous injection of warm water into the uterus, the injection of carbolic acid or atmospheric air into the uterus, galvanism, the application of a sucking-pump to the nipples, the separation of the membranes with the finger, the insertion of a long gum-elastic catheter, dilatation of the vagina, dilatation of the os uteri by elastic bags and sponge tents,—Dr. Godson concludes with a decided preference for dilatation by sponge tents. He some time since expressed this opinion in our columns. He adheres to this preference, and justifies it by reference to twenty cases. Ten children were born alive; one mother died of puerperal fever, then prevalent in the hospital; the rest did well. The tent is easily introduced, without using the speculum, with the help of an instrument specially devised for the purpose.

#### CHLORALISATION.

AN Austrian surgeon, M. Linhart, has communicated to Baron Larrey an account of an interesting case, in which the anæsthesia and muscular relaxation necessary for the reduction of a dislocation of the shoulder were obtained by the intravenous injection of chloral. The patient had inhaled chloroform on two previous occasions, but each time the excitement under the chloroform had been very intense, and much vomiting followed. It was therefore decided to chloralise him. The solution of chloral employed was neutralised by a

few drops of carbonate of soda. A gold needle was used, and the utmost care taken to ensure freedom from extraneous particles. The injection was made into the left arm. At the end of fourteen minutes seven grammes of chloral had been absorbed, and anesthesia was complete. There was not the least reflex movement. The reduction of the dislocation was effected with extreme facility. Absolute anesthesia continued for half an hour; he was then awakened, and he drank, and then slept for several hours. On recovering there was no nausea or vomiting. Slight defective sensibility continued for twenty-four hours. The vein into which the chloral had been injected showed no trace of irritation or of coagulation.

#### HYPERTROPHIC CIRRHOSIS OF THE LIVER.

H. HANOT, in his thesis (Dec., 1875), states that he has made out, by careful investigations at the Hôpital Cochin in Paris, a peculiar kind of hypertrophic cirrhosis of the liver, presenting the following characters: Extra-lobular and extensive cirrhosis without any tendency to retraction of the conjunctive tissue of new formation; and sometimes *intra-lobular* cirrhosis—abnormal development and chronic catarrh of the biliary ducts. Symptomatically it is characterised by chronic jaundice, depending on the obliteration of the biliary canaliculi, and by a considerable hypertrophy of the liver without ascites, or the abnormal enlargement of the subcutaneous veins of the abdomen, which is observed in ordinary cirrhosis. The affection may last a long time, but sometimes ends in the acute malady called "severe icterus." No particular etiology has been made out, nor is there anything reliable respecting treatment.

#### ACTION OF LACTIC ACID ON THE ECONOMY.

In the last part of the *Zeitschrift für Biologie*, Dr. Ernst Heiss, of Munich, discusses the question whether the inorganic constituents can be withdrawn from the bones of an animal by the introduction of lactic acid into the intestinal canal, and arrives at the conclusion that the acid has no such power, though the researches of M. Marchand show that the bones of rachitic children contain a greatly increased proportion of phosphate of lime, and a large quantity of lactic acid.

## News Items, Medical Facts, &c.

#### TREATMENT OF LICHEN TROPICUS, OR PRICKLY HEAT.

—This troublesome affection is only too well known to those who have had any personal experience of tropical climates. Surgeon-Major Dr. J. G. French, of the Indian medical service, in a contribution to the *Indian Medical Gazette*, after combating the recently advanced pathology as to the seat of the disease being an hyperæmic sweat-duct papule, says that we can cure prickly heat in three or four days by the application of a solution of sulphate of copper. This should be of the strength of about ten grains to the ounce of water, and the solution should be applied daily or oftener by means of a camel-hair brush, or bit of sponge tied on the end of a stick. It is best applied after the morning bath, when the skin has been well rubbed with the towel, and

it must be allowed to dry on the skin before dressing. Dr. French states that he has used this application for over thirteen years, and, when regularly and properly applied, he has never known it to fail.

**FATTY DEGENERATION OF THE PLACENTA AS A CAUSE OF DEATH IN THE FŒTUS.**—At a late meeting of the New York Academy of Medicine a paper on this subject was read by Dr. Leale. Fatty degeneration was regarded as the result of a defect, and not disease, of the nutrient process. Such defect might be developed in connexion with syphilis, phthisis, scrofula, and other conditions, and give rise secondarily to fatty degeneration. Records of cases were given in which the following changes had been found:—Fatty degeneration coincident with syphilitic sperm, the mother being healthy; simple fatty degeneration following placentitis, caused by a blow on the abdomen; fibrous deposits in the placenta in a mother who had cavities in both lungs; syphilitic fatty change in a case in which several miscarriages had occurred within six years; &c.

**THE USE OF ICE IN EPILEPSY.**—M. Charcot has followed Dr. Chapman's footsteps as to the use of the ice-bags, the cases not being altogether identical. M. Charcot's patients were hystero-epileptic, and experienced actual ovarian aura. He tried an ice-bag over the ovarian region, especially where the pulse was rapid and the palpitations very painful. The bag was left for half an hour, an hour, or an hour and a half, night and morning, with good results. M. Ferréol was equally successful in cases of ovarian hyperæsthesia by leaving the ice-bag two hours over the ovarian region three times a day. One case presented unusually severe symptoms, but was well in a fortnight.

**VESICATING COLLOID.**—Messrs. Gale and Co., of Bouverie-street, Fleet-street, have brought under our notice a blistering agent under this name. It is prepared by exhausting powdered cantharides by means of acetic ether and alcohol. The cantharides is tightly packed in a percolator, and the ether and spirit passed through until it is quite exhausted. To this solution a sufficient quantity of pyroxilin is added to convert it into colloid. This is next rendered flexible by the addition of Canada balsam and castor oil. The preparation is a powerful vesicant, and has the great advantage of not spreading like the ordinary blistering liquids.

**FIBRINE AND IODINE AS ANALEPTICS.**—M. Eysanther communicated in March, 1876, to the Medical Society of Lyons his researches on the nutritive powers of fibrine. These powers are much increased by the addition of iodine. The author considers that iodine can thus be introduced into the organism without any danger by means of the dried fibrine. The latter may also be combined with chalybeate salts, the citrates and tartrates, the pyrophosphites, the ammonio-citrates, and especially the iodide of iron. All these combinations are easily absorbed, and present, in a small bulk, the greatest possible proportion of nutritive elements.

**CHLORAL IN TETANUS.**—This substance has been known to fail in several instances; but it appears (according to the *Journal de Méd. de la Haute Vienne*, March, 1876) that Dr. Bleyne has had a favorable case. The patient, aged fifty, had cut his finger with a hatchet, and was seized with trismus and tetanic contractions in other parts of the body. The first dose of the chloral began at forty-five grains, the third part to be taken every ten minutes. This was continued every three hours for several days, when the quantity was diminished, and in a fortnight the patient was well.

**ACTUAL CAUTERY IN DISEASES OF BONES.**—M. Philippeaux has published an article in the *Lyon Medical* of Aug. 6th, 1876, in which he shows that caries of the os calcis may be arrested by perforating the bone with a red hot skewer, endeavoring thus to destroy the carious portion of the bone and setting up healthy action? This proceeding is especially applicable to young people. With the old and feeble the removal of the calcaneum by M. Ollier's method, is preferable.

PRINTED AND PUBLISHED BY

WM. C. HERALD, Nos. 38 & 34 JOHN ST., NEW YORK.

# THE LANCET.

A Journal of British and Foreign Medicine, Physiology, Surgery,  
Chemistry, Criticism, Literature, and News.

JAMES G. WAKLEY, M.D., M.R.C.S., EDITOR.

PUBLISHED MONTHLY.

No. 12.

NEW YORK, DECEMBER, 1876.

## Introductory Lecture

DELIVERED AT

UNIVERSITY COLLEGE,

On October 2nd, 1876,

By HENRY MAUDSLEY, M.D.,

Professor of Medical Jurisprudence in the College.

GENTLEMEN,—It has devolved upon me this year to deliver, in accordance with prescribed custom, the introductory lecture to the course of systematic instruction upon which you are about to enter. At the outset I am free to confess that I have been not a little perplexed and troubled about what I ought most fitly to say; like many of my predecessors in the office, I have found the choice of subject beset with difficulties, and I have small hope that I can say anything to redeem the usual barrenness of the occasion. It is just twenty-five years since I, sitting where one of you now sits, listened to my first introductory lecture from the lips—mute, alas! now for ever—of one whose pure and gentle nature attracted in no common measure the esteem, the respect, and the affection of all who knew him. I mean the late Dr. Parkes. It is an extraordinary, almost an unparalleled, thing to say of any man, that no one who heard mention made of his name ever heard an ill word said of him; but I believe that this was strictly true of Parkes. His life, lovely and of good report throughout, was indeed a practical refutation of the saying, "Woe unto you when all men shall speak well of you." If I could sketch in striking outline the features of his character, and set forth justly the pure course of his life—showing with what patient industry and entire sincerity of insight he worked in scientific inquiries, how upright he was in all his ways and how kindly considerate to others: how he lived, and how, his work faithfully done, he died,—I should probably give you an inspiring and most useful introductory lecture; for I should present to you a noble example, the labor to imitate which would be an excellent scientific and moral training. But that has been done with more or less completeness by vari-

ous persons, though not always, perhaps, with the discrimination which one would wish to see shown in the appreciation of such a character. It is a very amiable wish to say everything good of a man when he is silent for ever, and the vocabulary of flattering words is apt to be exhausted in the endeavor to gratify this feeling; the effect sometimes being that the actual features of the character are blurred, and something which is intended to be very perfect, but which is very unreal, is produced. It seems to me that the distinguishing characteristic of Parkes, that by which mainly he was what he was, was not so much originality or height of intellect (in this others have equalled or surpassed him) as the height of his moral stature—in this perhaps he has hardly ever been surpassed; and that the grand lesson to be learned from the extraordinary esteem and affection which he inspired, from the infection of earnestness and sincerity which spread from him, and from the elevating influence which he exerted upon those who were brought into close converse with him, is a lesson which the history of human progress through the ages teaches too, and which needs much to be had in remembrance in these days of the glorification of science. It is this: that great as is knowledge, the moral nature is greater still; that the impulses of evolution which move the world come not from the intellect, but from the heart; that he who would work upon the hearts of others must speak to them from the heart; that everywhere and always we have to recognise the predominance of the heart over the intellect.

Perhaps if I could recall vividly the thoughts and feelings of my mind when sitting there twenty-five years ago, and compare, or rather contrast, them with my thoughts and feelings now, I might extract from the comparison the essence of a quarter of a century's experience of life, and impart to you what it will probably take you a quarter of a century to acquire. But I am doubtful whether that would not be to do you a great disservice. For I could hardly fail thereby to take much heart out of your hopes, much ardor out of your enthusiasm, much energy out of your exertions. Moreover, I feel pretty sure that what I could say, however wisely it might be said, would not be of the least use to you. Neither nations nor individuals profit much by the experience of other nations or of other individuals; they must

go through their experience for themselves, learning through suffering, succeeding through blundering, attaining to the calmness of wisdom through the fevers of passion; and many times only when opportunities are gone, and their consequences in irrevocable operation, is it seen perhaps how much better use might have been made of them. No doubt there is wise purpose in this inability of the young to take home and assimilate the experience of those who are older; for I know not how they could preserve that enthusiasm and freshness of spirit which make life itself a joy, and beguile them to pursue with eagerness its aims, were their illusions destroyed, as illusions one after another are destroyed by experience. In the full stream of its young energy life is too little conscious for reflection; to live is happiness enough; in its later stages more and more, as the heart is applied to know wisdom, is it felt to be vanity and vexation of spirit. This may seem a hard doctrine, but it is true; it has been the experience of the greatest sages of all times; it is the central thought of the great religious systems of the world.

Let me pass, however, from reflections which, if pursued, might tend to dishearten rather than to hearten you, and endeavor to show you that, as things go, you have made a good choice of a profession for your life's work. I should be thought to have ill discharged the function of introductory lecturer by preaching a gospel of pessimism, and inoculating you at the outset of your career with a despair of the littleness of life. Whatever the motive which has made you choose the medical profession as your life-career—and I suppose this has in most cases been the advice or example of others, or perhaps some quite accidental influence; for it is a startling consideration on what little circumstances the great issues of life often turn—you will not, I think, ever have cause to regret your choice if you look to the higher aim of it, and to that which is the proper end of human life. But on that condition only. It is not a profession which one who is ambitious of worldly distinction, or eager to accumulate much riches, should choose. You might, with prudence and industry, get vastly richer on the Stock Exchange or in commerce in a short time, than you will probably after the labor of a long life in medical practice; and if you would aspire to gain a peerage or other ornamental thing of that kind, you would have done better to have gone into the army, and to have set before you as an aim, not the saving but the destruction of life; or to the bar, and have sold the highest exertions of your intellect to advocate the cause, whether the cause of the oppressor or of the oppressed, for which you were retained. Peerages don't come our way, and I am heartily glad that they do not, for I much fear that there would not be the strength of mind to reject them; that a pitiful social ambition might tempt us to spoil the simple intrinsic nobility of our vocation with the outworn decorations of a childish stage of human progress. If medical practice be pursued as a mere means of money-getting, assuredly it causes the deepest demoralisation of him who so uses it, as best things turned to basest ends breed the greatest corruption. He who deliberately applies himself to take the utmost advantage of the suffering and the feebleness of humanity, coming to him for aid in its anguish and its utter helplessness, in order to make his profit—and we may hope there are not many creatures of that vileness in the pro-

fession—may have large success in his low aim, but he discovers a meanness and a degradation of nature which are a grievous shame to his kind, and which devils might almost disdain.

But if you look to what is the true end of knowledge and work—to relieve the suffering and to minister to the comfort of man's estate, to lessen the sum of human sorrow on earth,—you have chosen a profession which yields the fullest satisfaction to your aim and the largest scope to your work. We learn in order to act, the end of all knowledge being action; and the end of all action is to promote the welfare and the progress of mankind upon earth. In no profession are the opportunities of doing this good work so great and constant as in ours; to the least of us, as to the greatest, occasions of tender sympathy and patient help occur every hour in the daily routine of our work; and no profession, therefore, rests so little for appreciation upon any adventitious circumstance of time or place, or so little needs extraneous titles of honor to give it dignity and respect. Put a doctor in the midst of the wildest savages, and they will respect the "medicine man," when the lawyer's fluent sophistry and the preacher's pathetic eloquence would not gain them consideration, or even save them from death. Livingstone passed unharmed and esteemed among the savage tribes of Africa under the protection of his medical skill; and Christ himself cultivated the character and functions of a healer of disease, not only because in that capacity He went about doing good, but probably also, as De Quincy surmised, for the secret reason that He thus disarmed the jealousy and suspicion which the ruling authorities might otherwise have felt of the crowds which He drew about him. When the mighty fabric of the Roman Empire, penetrated by internal decay, at last fell to pieces under the successive assaults of the Goths and the Vandals and the Huns, many thousand persons were, as Gibbon tells us, taken captive and distributed through the deserts of Scythia; and it is interesting to note what was the relative value of persons under these circumstances. "The skill of an eminent lawyer would excite only their contempt or their abhorrence. The vain sophist or grave philosopher who had enjoyed the flattering applause of the schools was mortified to find that his robust servant was a captive of more value and importance than himself. But the merit of the physician was received with universal favor and respect: the barbarians who despised death might be apprehensive of disease." So long as man deems it the most important thing in the world to him that he should go on living—and he does that commonly as long as he is alive—so long will he hold in favor and esteem him whom he believes able to prevent or to mitigate the suffering of disease, and to keep at bay "the last enemy," death. It has always been so. "Honor a physician with the honor due unto him for the uses which ye may have of him; for the Lord hath created him."

Having seen how good a thing is the direct work of relieving suffering by medical art, let me now go on to point out that the training through which you go in order to fit yourselves to do this is excellently well adapted to make the most of your intellect as an instrument of knowledge. It seems to me that no education which is given anywhere, taking it all in all, is better than that through which it is necessary to go in order to become a

thoroughly accomplished physician. You are brought into direct contact with the facts of nature, face to face with them, from the beginning of your course; step by step you advance in the practice of observation and reflection from more simple to more complex phenomena, and so you learn to make the order of your ideas conform gradually to the order of nature. That is real instruction; moreover, it is instruction at first hand. In intercourse with nature sophistry and pretence avail nothing; sincerity and humility and veracity of mind are essential; we must learn patiently her laws, and, learning, obey them, or we ourselves, our contemporaries, or our posterity will suffer infallibly from their violation. There is no possibility of hoodwinking those eternal laws which, in our dealings with them, never make a mistake and never overlook one, never forego an advantage, never shrink to exact retribution, never feel remorse. When a person leaves college with a very respectable knowledge of Greek and Latin authors, and with little or nothing more than that, it seems preposterous that he should think himself an educated person. If he has learned nothing about the stars above his head and the earth beneath his feet; nothing about the nature of the air which he breathes, of the water which he drinks, of the food which he eats; cannot tell why water rises in a pump, or how a man breathes, and why he dies if he cannot get air to breathe; knows nothing whatever of the laws of the world in which he lives and of which he is a part,—he is surely a profound ignoramus, notwithstanding that he may be able to make indifferent Greek or Latin verses. I would not for a moment undervalue the priceless benefits of a knowledge of Greek and Latin authors; on the contrary, I am sure that a study of the works of these great minds of antiquity, full as they are of the rich stores of human observation and thought, expressed in the most chaste, concise, and finished language, produces a discipline of intellect and a refinement of culture which can be got in no other way, and the loss of which in youth nothing gained afterwards will ever entirely compensate for; but I am sure also that if Plato or Aristotle or any of those great thinkers of antiquity were to live again now, he would look with amazement and compassion, if not with contempt, on men who are content that education should consist in studying only the writings of the past, in utter neglect of the wonderful works of nature to which the later ages of mankind have gained access, and of the vast stores of knowledge which have been gradually accumulated by the patient labors of successive generations of men. He would be apt, I think, to say something of this sort, "Good heavens! we lived more than two thousand years ago; have you in all that time gained no new experience of men and things which it would be well to make an essential part of the intellectual culture of your children? Is it education enough for life now to let them learn from us what we thought of men and things more than two thousand years ago, and to train them in a study of the structure of our dead language?" To state the matter so sufficeth to expose its absurdity.

Now, the training of a medical man, when thorough, is admirable in this respect, that it follows the order of nature, beginning with the less complex and rising to the more complex sciences, using the lower as a ladder by which to mount up

to the higher. Coming to his work, as he certainly should do, with a fair knowledge of mathematics and physics, he proceeds to the study of chemistry, and passes on thence to the study of physiology; so he lays deep and firm the scientific groundwork for the study of the disorders of the structure and functions of the body, which is to be his ultimate special work. Without the foundations of the pre-requisite studies he will not be a thoroughly well-grounded and cultivated physician, who may be relied upon to perfect his knowledge by experience through life, although he may no doubt be a fair practitioner in the routine which he has been taught, or, if he devotes himself to surgery, skilful as a mere operator. A knowledge of the simpler and more general science is an essential pre-requisite to the study of the more complex and special science. Physics lie beneath chemistry; in physics and in chemistry we search for those intimate operations of matter which lie at the foundation of physiology; and physiology in its turn is essential to the construction of the more complex science which is concerned with man in his social relations—that is, sociology. And I may observe, by the way, that psychology, which is an important study for the man who has to put right the disorders of the minds and bodies of his kind, demands not only a thorough knowledge of physiology, but observation, also, of man in his social relations. Each science rests upon the one below it, but reflecting the increasing complexity of nature as we rise from the movements of masses to the movements of molecules of matter, and to the combinations and relations of atoms, from dead again to living matter, from the simplest forms of life to complex organisms, and from organisms to the social union of organisms, contains in ascending scale something more than the science below it—something which constitutes its autonomy as a science. Physiology being placed in this scale, as you perceive, between chemistry and sociology, is on that account a most instructive study at the present time, when chemistry has made great progress towards scientific exactitude, and when the cultivation of the new field of social science is just being entered upon; there is no science, in fact, which yields such rich promise of large discoveries in the immediate future, and no science the discoveries of which, when applied to human needs, will do so much to lessen physical suffering. Fortunate are you, then, in the training which prepares you for the study, and in the lot which at this particular era has fixed your work in the pursuit, of a science which promises so great an abundance of good fruit.

One warning I would stop a moment here to urge. While recognising the subordination of the sciences, we ought not to overlook the fact that all the sciences are at bottom artificial divisions; that the world is not divided rigorously into those different domains which we call physics, chemistry, physiology, and the like; that we make the divisions for our convenience according to the complexity of the phenomena, not because we discover them in nature. Nature is one and continuous, and takes not the least notice of the arbitrary divisions which we find it necessary to make. It would seem a very obvious distinction between plant and animal; and yet if we push our investigations into that border-territory of nature where animal and vegetable life touch, we meet with so-called monads—the *Heteromita*, for example—

which may be referred with equal justice to either kingdom; there are organisms which we think vegetable having characters which we call animal, and organisms which we call animal having characters which we think vegetable; there is, in truth, no line of demarcation, but instead an insensible series of gradations, and no man can say where the one kingdom ends, and the other begins. In like manner, notwithstanding the seemingly gross and palpable distinction between living and dead matter, anyone who sets himself to work to find out where life begins will be hard put to it to draw a line of separation, and more hard put to it when called upon to make good his division. Man himself, much as he makes of himself, is not separated from the rest of nature by an impassable gulf; he modifies nature largely it is true, but the art by which he does that is nature; he is a part of the order thereof—the latest product of the evolution which went on for countless ages before he appeared upon earth, which is going on now in his progress, his knowledge and his moral feelings being agencies in the process, and which, for anything we know, will go on for countless ages after the earth, which he has ceased to replenish and to subdue, has fallen into the condition in which the moon now is, and rolls on its solitary way through space, a cold and desert globe, the tomb of all human aspirations, sorrows, sins, and achievements. In making use, then, of the arbitrary divisions of our sciences we ought never to lose hold of the actual unity and continuity of nature; never to overlook the fact that there is not a single truth in any science which has not its essential relations with the truths of all sciences; never to forget that the least things and the greatest are indissolubly bound together as equally essential elements of the intimately connected and mysterious whole which we call the universe. It may seem a fanciful saying, but there is a truth in it, that you cannot utter an exclamation, strike a note on a piano, move a grain of sand from its place, without affecting the entire universe.

Now the systematic training of the mind in conformity with the order of nature, through patient observation and careful induction, the knowledge of nature which is got by becoming, as Bacon says, her servant and interpreter, is a tedious business. Men therefore have gladly shirked it; they have found it much easier to attribute phenomena to some metaphysical entity which they have created out of a mental abstraction, or to invoke a supernatural cause to account for them, than to find out the explanation. In consequence of this habit of mind, which has had large operation in the past, a body of doctrine has grown up which, having had its day, is now fast becoming effete, but which men will not willingly part with—doctrine comparable, if I may use a physiological comparison, with those organs which, like the thymus gland, have their uses at a certain stage of the body's development, but afterwards, having no longer any function, undergo atrophy. Moreover, men have not only shirked positive inquiry from indolence, but have hated it from hostility. They dread the thought of being shown to be one with nature, and repudiate with abhorrence the suggestion that their bodies and minds will ever receive scientific explanation; as if their bodies and minds would be degraded to something quite different from what they are by being understood like other natural phenomena and described in

terms of scientific thought. The supposition strikes them as something like a blasphemy against the nobility of their nature. Hence there is a deep-rooted instinctive hostility to the science that has to do with man, which you will have to take account of in your careers—a hostility which has found partial expression, I think, in the anti-vivisection agitation. There was more in the fierceness of that agitation than a laudable feeling of compassion for the animals—an intensity of acridity betraying another origin. There was the energy of fear and hatred—fear and hatred of the science which threatens the dethronement of man from the pedestal of conceit upon which he has placed himself and the destruction of some of his traditional beliefs. But a little reflection might serve to prove to those who are moved by these hostile apprehensions that they are possessed with an unreasoning fear, and are disquieting themselves in vain. Let them look beyond the dark circle of their self-love, and they will see that what is good in old creeds does not perish; that, although old forms vanish, as generations and nations pass away, that in them which gave life to them does not pass away, but puts on new forms and survives, as new generations and nations follow and carry onward the work of progress. Better would it be for them to seek for and foster the good which survives than to lament and defend the old which is corrupt.

Certainly science has not been careful to avoid occasions of offence in its progress, and of its method and pretensions its votaries have sometimes written in a strain which justly provokes scorn. While proclaiming, then, the praises of observation and induction, and enforcing the value of a mental training which is obtained by studying nature after that method, let me interpose a few words of qualification, in order that I may not be misunderstood. I cannot help feeling that a great deal of questionable doctrine has been propounded concerning the so-called method of induction which science is enjoined rigidly to pursue, and that Bacon would have been aghast had he seen the absurdity which some persons in these days describe as his method, and the imbecile procedures of some of those who believe that they are following it. They talk, in fact, of the method of observation and induction as if it were something to conjure by; a mechanical process of knowledge-getting which rendered superior mental capacity unnecessary; a sort of intellectual ladder by which the most stupid beings, if they only planted it properly, might mount up into the highest places of knowledge. That was not Bacon's notion of it; he perceived clearly enough that a man does not see with his eye, but through it; that seeing in the sense of observation is impossible unless there be behind the eye the intelligence to interpret what is presented to it. The simplest act of perception is indeed more than a mere matter of sense; it is an actual induction or inference in which an important element is contributed by the mind; you cannot look at an ox or an ass, and know either of them to be what it is, without making an induction—can't see, in fact, until you are trained to see. Scientific observation and experimentation—and experiment is only observation aided by artificial means—may be carried on to the last hour of your lives without any result of the least value if you have not a mind trained to interpret. Of what use is it to torture



nature by strange experiments if you don't understand her language! You might sacrifice a hundred dogs or cats in cruel experiments, and be not a whit wiser at the end of your awful labors. Nature does not vouchsafe an answer to a scientific inquiry unless the intelligent question be put, and the precise experiment made, as Bacon insisted, *ad intentionem ejus quod queritur*; and it is impossible to put the definite question, or to make the precise experiment, unless there be a prudently formed hypothesis in the mind—that is to say, a hypothesis based upon previous careful training in observation of nature's processes and sound reflection upon them. The mind must be informed by patient and sympathetic intercourse with nature; it is enabled then to make new adjustments by means of the knowledge which it has gained through past adjustments—to frame a new and true theory applicable to new experiences by reason of being stored with sound theories derived from past experiences. We shall do well, then, not to be too much intimidated by what is sometimes said or written in praise of mere observation of so-called facts, and in dispraise of theory, or imagine that any facts can be truly observed, or any science prosecuted with success, unless the well-trained mind co-operates with the senses. As I have said elsewhere, "That some declaim so virulently against theory is as though the eunuch should declaim against lechery; it is the chastity of impotence." Happy is the observer who, when he sets to work, has a good theory in his mind. The mischief is when men theorise who have not been trained in habits of accurate observation, or, I might go a step further and say, who have not inherited from father or grandfather in the foundations of their nature the lines of veracity of observation and thought on which to develop; for when one notices how persons of a certain eager temperament go on discovering facts which are no facts, and, notwithstanding that they are brayed in the mortar of an annihilating criticism, are not in the least benefited by the discipline, one cannot help feeling that the observer, like the poet, is born, not made.

But it is time to return to the direct line of my argument. From what has gone before, it should appear at what an excellent place of advantage the order of studies for the medical profession is adapted to place you; how wisely it is arranged to train the mind for sound reflection upon those most complex phenomena of nature with which the medical man has to deal—the phenomena of life in health and in disease; and how sadly wrong in theory and mischievous in practice he is likely to be who neglects to lay well the foundations of his mental training. If no practical result were to follow a medical education, if it were not pursued, as it is, for the purposes of the medical art, I believe that one who aspired to fit himself best to understand the world in which he lives and the men with whom he has to do could not do better than go through it; for it would be an excellent foundation on which to build afterwards. The study of man cannot be undertaken with any satisfaction, or carried out with any completeness, except through a previous study of the nature of which he is the present culmination; it is certainly not possible to enter the chamber of the mind without passing through the ante-chamber of the body; and we cannot understand the body unless we understand a good deal of the processes and

laws of nature which lie beneath biology. So far, then, Mr. Lowe appears to be right when he regrets, as he is in the habit of doing, that he was taught so much classical knowledge and no science when he was educated, and contrasts the disadvantages under which he labored with the advantages which each student at a middle-class school now enjoys. Newspaper critics think that he is making jokes or firing off paradoxes, and would seemingly rather have Mr. Lowe as he is than Mr. Lowe as he might or would have been; but I am disposed to think that Mr. Lowe's insight has enabled him to see what his critics quite fail to see—that the statesman who has to deal with the relations of men to one another in the world would be better qualified for his work if he had a good fundamental knowledge of the laws of man's nature and constitution and of the laws of the world in which he lives. The scientific statesman—when we get him—will hardly deem it his highest achievement to shrink scared from the grasp of a principle, or his supreme privilege and merit to wait patiently to catch the fitful gusts of an ignorant public opinion.

The application of the principle which I have been enforcing, of learning to know man through nature, the thorough knowledge of his environment and of those of his relations to it which constitute his life, must clearly be the foundation of a scientific medicine. Here, as elsewhere, provision for the purposes of action is our aim; we observe and infer in order to foresee, and, foreseeing, to modify and direct; we conquer by obeying, gaining a knowledge of the phenomena of living beings in order to make ourselves master of them, just as by a knowledge of physics and chemistry we gain a mastery over the phenomena of physical nature. It is impossible to treat a sick person, except in the most lamely empirical fashion, without a knowledge of the properties of the organism and of its relations to its environment; for our medical function is to remove the disorder of these relations, which is disease, and to restore the harmony, which is health. In past times it has been too much the practice to treat the body as if it were an entirely independent kingdom, without regard to its essential relations with surrounding nature, and to try to drive out the enemy which was supposed to have taken possession of it, by pills and potions, as barbarous nations try to drive him out by charms and ceremonies. Now, however, in the recognition of the intimate and constant relations between the organism and its surroundings we are awaking to juster views of our duties as observers and of our work as curers of disease; but it is because of the absence yet of anything like exact knowledge in this respect that medical practice is defective, tentative, empirical, often mere guess-work, and that the most experienced physicians, waiting patiently on nature, aim to do the least harm by the drugs which they employ.

But we are perceiving more clearly day by day a larger application of this principle of looking to the relations of man, to what is around him as well as to what is within him, in the fulfilment of the great purpose of preventing disease. It is in this direction that the future course of medicine lies clearly open, and to this end that we must work; it will rise to the true height of its great vocation when it watches over communities and ministers to the welfare and development of the race, I am apt to think that we shall attain to

earlier and larger success in preventing the diseases of communities than in curing the diseases of the individual, as men who had been seeing heavy bodies fall to the earth every moment of their lives discovered the law of gravitation for the first time when they began to observe the grand general motions of the heavenly bodies. Indeed, we have already had encouraging success. Look through the yearly death-list of this great city two hundred years ago, and you will find a large proportion of deaths ascribed to diseases which have now been robbed of their sting, if they are not quite extinct. Many persons died then, as "that chief of men," Cromwell, did, from ague. Where is the mortality of ague now? Ague has disappeared with the disappearance, through better drainage, of the damp fogs which occasioned it, as ghosts and other superstitions have vanished with the disappearance, before the light of knowledge, of the fogs of ignorance in which they were engendered. Bloody flux or dysentery seldom occurs now in this country, and is more seldom fatal, but it caused many deaths two hundred years ago. The ravages of small-pox were then terrible, hosts of victims being carried off by it, and many persons who escaped death bearing its marks in blind eyes and hideously-scared features; but I think we may foresee a time when, Keighley guardians notwithstanding, small-pox will no more afflict a prudent people. Plague, scurvy, and spotted fever, each of which then claimed regularly its yearly tribute of victims, are becoming almost diseases of the past, and one needs not a prophet's imagination to foresee a time when cholera, scarlatina, fever, phthisis perhaps, and other diseases, will be no more; when preventive medicine shall have reached such a degree of perfection that the occurrence of epidemic disease will be felt as a gross reproach to the community, and when there will be comparatively little for the practitioner to do in the treatment of particular disease. It is unfortunate truly, as it is sadly unseasonable, that just when we see before us this fairer prospect, and when an encouraging beginning of progress has been made under the auspices of Mr. Simon and his well-organised staff, he should have been driven from office and his office abolished. But one instance more of the difficulties with which progress has to contend from the selfish intrigues and obstructive apathy of mankind!

You may be disposed perhaps to smile at my outlook as fancifully bright, and besitting only the imaginative flights of an introductory lecture. From the beginning, it may be said, men have, through unrestrained indulgence of their passions, generated disease, and however pure their surroundings may be made, they will go on doing the same thing: were a clean sweep made of all disease from the face of the earth to-morrow, they would breed it afresh before to-morrow's morrow. No doubt as they are constituted and trained at present they would be apt to do so; but one may hope that the medical science of the future—and here I would carry your imaginations a little way with me—will have a great deal to say in the way of instruction respecting the highest concerns of man's nature, and the conduct of his life; that it will enter a domain which has hitherto been given up exclusively to the moral philosopher and the preacher. I don't propose or suppose that we shall ask these gentlemen to step down from their platform, saying to them something of this kind,

"You have been preaching wisdom and goodness of conduct for some thousands of years, and you haven't made much of it. Certainly one result thus far is striking enough: that men are devoting their eagerest energies to making the most destructive guns, and are conferring their greatest honors and applause on those who use them with the most destructive effects. For months, until quite lately, the soil of Eastern Europe was deluged with blood, shed amidst unspeakable atrocities, in an entirely needless war, which your statesmen, presumably the highest products of the culture of your epoch, could or would do nothing to check. Stand aside, then, and let us try our method." To speak so would be as foolish as it would be arrogant; but we may perhaps, without undue presumption, promise them that if they will learn and use the results of our method, they will have a deeper and more stable foundation in the constitution of human nature for their teaching than they have now, and will add much to the efficacy of it by enforcing motives which will touch more keenly the springs of human conduct than those which they present. Now let me indicate very briefly, as must needs be, the method by which medical science is to advance to take possession of this higher ground.

Starting with the trite maxim that before we can act we must learn, it is obvious that before we can teach men to act with more wisdom than they have done in the past, we must give them a better knowledge of their own nature and relations than they have had. This we propose to do by the patient and steadfast application of the method of observation and induction, which has served us so well in the subordinate branches of science, to the highest phenomena of man's being—his thoughts, feelings, and conduct. The problem is the same here, in fact, as in the lower sciences—to observe in order to foresee, and to foresee in order to modify and direct; and the method is the same. Admitting, as I see not how we can help doing scientifically, that a process of evolution has gone on in nature, and that man, as he now is, is a product of the past carrying on this process in his progress to a higher purpose in the future, it is a natural conclusion that he must, as a part of nature, be studied by the same method as the rest of nature. We have to search back and find out how he came to be what he is by looking to the historical evolution of the race from its earliest known conditions, and by tracing in the development of the organism the operation of laws which we discover at work under less complex conditions in the rest of nature. When we do that, we find the best reason to believe that the highest faculties of his mind, his intellect and his moral feelings, have not been implanted ready-made in his nature at any period of its history, but have been the slowly won results of the accumulated experiences of the race transmitted by hereditary action: that is the lesson which observation and induction, applied to the investigation of the origin and development of man's higher nature, teach with an authority which cannot be gainsaid from any standpoint of positive knowledge. I could have wished, had I had time, to have shown you how some phenomena of mental disease, which may be looked upon in this relation as instructive experiments of nature made for us in a domain where we cannot make them for ourselves, confirm the induction which has been reached by observation of

human development," both in the individual and in the race. But I must leave that unsaid, and restrict myself to the conclusion as regards conduct which results from the acknowledgment that the latest and best acquisitions of man have come to him by a process of ordinary development through the ages. For the problem of to-day is truly no longer the schoolmen's much vexed question of the origin of evil, but the question of the origin and growth of good. Our plain duty is to find out the laws which have been at work in that process, and to continue it—to carry on, by deliberate method, with conscious purpose, the development which has been going on through past ages irregularly and blindly. The time, in fact, has come when mankind should awake to the momentous reflection how great is the power which it may exert over its own destiny, and to the resolution methodically to use it. In fulfilling this paramount duty, upon whom will the function of inquiry and instruction immediately rest, but upon those who make the laws of vital development and function their study, and the application of the knowledge to further the wellbeing and development of the organism their work? Clearly, the medical investigator need not lapse into despair because he has no new conquests to make.

You will not be long in practice before you will have many occasions to take notice how little people ever think of the power which they have over their own destiny and over the destiny of those who spring from them—how amazingly reckless they show themselves in that respect. They have continually before their eyes the fact that by care and attention the most important modifications may be produced in the constitution and character of the animals over which they have dominion—that by selective breeding an animal may almost be transformed in the course of generations; they perceive the striking contrast between the low savage with whom they shrink almost from confessing kinship and the best specimens of civilised culture, and know well that such as he is now such were their ancestors at one time; they may easily, if they will, discover examples which show that by ill living peoples may degenerate until they revert to a degraded state of barbarism, disclosing their former greatness only in the magnitude of their moral ruins;—and yet, seeing these things, they never seriously take account of them and apply to themselves the lessons which lie on the surface. They behave in relation to the occult laws which govern human evolution very much as primeval savages behaved in relation to the laws of physical nature of which they were entirely ignorant—are content with superstitions where they should strive to get understanding, and put up prayers where they should exert intelligent will. They act altogether as if the responsibility for human progress upon earth belonged entirely to higher powers, and not at all to themselves. How much keener sense of responsibility and stronger sentiment of duty they would have if they only conceived vividly the eternity of action, good or ill, if they realised that under the reign of law on earth sin and error is inexorably avenged, as virtue is vindicated, in its consequences; if they could be brought to feel heartily that they are actually determining by their conduct in their generation what shall be predetermined in the constitution of the generation after them. For as-

surely the circumstances of one generation make much of the fate of the next.

In the department of medical practice in which my work mainly lies I have this amazing recklessness strongly impressed upon me; for it occurs to me, from time to time, to be consulted about the propriety of marriage by persons who have themselves suffered from insanity, or whose families are strongly tainted with insanity. You will not be surprised to hear, I dare say, that I don't think anyone who consults me under such circumstances ever takes my advice except when it happens to accord with his inclination. The anxious inquirer comes to get, if he can, the opinion which he wishes for, and if he does not get that, he goes away sorrowful, and does just what his feelings prompt—that is, gets married when he has fallen in love, persuading himself that nature will somehow make an exception to inexorable law in his favor, or that his love is sufficient justification of a union in scorn of consequences. Certainly I have never met with so extreme a case as I chanced to light upon in a book a short time ago. "I actually know a man," says the author, "who is so deeply interested in the doctrine of crossing that every hour of his life is devoted to the improvement of a race of bantam fowls and curious pigeons, and who yet married a mad woman, whom he confines in a garret, and by whom he has insane progeny." But I have met with many instances which prove how little people are disposed to look beyond their immediate gratification in the matter. If it were put to two persons passionately in love with one another that they would have children one of whom would certainly die prematurely of consumption, another become insane, and a third, perhaps, commit suicide, or end his days in work-house or gaol, I am afraid that in three cases out of four they would not practice self-denial and prevent so great calamities, but self-gratification, and vaguely trust "the universal plan will all protect!"

Those who pay no regard in marriage to the evils which they bring upon their children, or in their lives to the sins by which the curse of a bad inheritance is visited upon them, may plead in excuse or extenuation of themselves the vagueness and uncertainty of medical knowledge of the laws of hereditary action. We are unable to give them exact and positive information when they apply to us, and they naturally shelter themselves under the uncertainty. Were our knowledge exact, as we hope it will some day be, we could foretell the result with positive certainty in each case, and so speak with more weight of authority. It is one of the first and most pressing tasks of medical inquiry to search and find out the laws of heredity, mental and bodily, in health and in disease, and having discovered exactly what they are, to apply the knowledge purposely to the improvement of the race—that is, to prevent its retrogression and to promote its progress through the ages. I see no reason to doubt that by discovery of these laws and intelligent practical use of our discoveries we might in the fulness of time produce, if not a higher species of beings than we are, a race of beings at any rate as superior to us as we are superior to our primeval ancestors; the imagination of men seems, indeed, in the Gods which they have created for themselves, to have given form to a forefeeling of this higher development. But I will not pursue this pregnant matter further now

I have touched upon it only for the purpose of illustrating the large scope of the medical work of the future, which is to discover those laws which have been in operation through the past to make man the superior being which he is, and to determine his future action in intelligent conformity with them; not only to cure disease of body and mind, as it has aimed to do in the past, and to prevent disease, as its larger aim now is, but to carry on the development of his nature, moral, intellectual, and physical, to its highest reach.

So much, then, concerning the three topics on which I have proposed to myself to discourse in this lecture—namely, the nobility of your direct function as healers of disease, the excellence of the method of medical study as a means of intellectual and moral training, and its fruitfulness in benefits to mankind, and the grandeur and the reach of its aspirations for the future. Let me hope that I have, in fulfilment of my design, said enough to satisfy you that you have made a good choice of a profession for your life's work. Having chosen, it remains only that you should justify your choice by your work, so that it may be said of each of you when his long day's task is over and the night has come, that he was in his right position in the world and made a right good use of it. Life has its three stages—youth, manhood, and old age; let it be your anxious care now, in the first stage of joy and hope, so to pass the second stage of work and duty that the last stage may not be a long regret.

I will ask your indulgence only for a few minutes more, while I detain you for one or two final reflections of what I may call an inhibitory character. In pursuing resolutely the course of scientific inquiry which I have indicated, it must needs be that offences sometimes occur, for we can hardly fail to come into collision with some of the prejudices and traditions of mankind. I do not know how it is possible, for instance, to prosecute the physiological investigation of mind to its furthest reach without shaking the foundations of the metaphysical notions which have been held concerning it and its functions; and with the fall of these notions, long cherished of mankind, other notions that are bound up with them may totter to their fall. But if this must be, we shall do well to acknowledge it more in sorrow than in anger. Let us not rush with eager fury and exultant clamor to the work of destruction; it behoves us, as products of the past, who will one day ourselves constitute the past, to deal gently and even reverently with it. We cannot break with it if we would, nor should we if we could. The very language which we use we owe to the slow acquisitions of generations which have preceded us; we cannot compassionate or condemn them except in words for which we are indebted to them. There is hardly a word I have used in this lecture which, were its history searched out, does not mean generations of human culture to which we are heirs. Seems it not then a wicked, almost a sacrilegious, thing to hasten with eager gladness to repudiate the past to which we owe everything, and to exult over the ruins of its beliefs? It is as if a son should rejoice over his father's feebleness, uncover his nakedness, and make scorn of his infirmities. As he who has been the best son is in turn the best father, so the generation which guards with respect the good which there is in the past, and puts gently aside that which is effete, will

make the most stable progress in its day, and transmit the best inheritance to the generation which follows it. No doubt in the future, as in the past, the knowledge of one period will sometimes appear foolishness at a more advanced period of human evolution—the truth of one age become the laughing-stock of the next; but we may profitably reflect that decaying doctrine had its use in its day, and it may teach us modesty to consider that much which has its place in our mental organisation now, and is serving its proper end in the development thereof, will one day probably be put aside as obsolete belief. Let it be our prayer that when that day comes, and this generation comes up for critical judgment as a historical study before the tribunal of posterity, it may be justly said of it that it has done as much for the progress of mankind as some of the generations upon which the wisest of us look back perhaps with indulgent compassion, and the unwise among us with foolish scorn.

There is nothing in the attitude of modern society towards science, cold and suspicious as it may sometimes be, which necessitates or warrants an arrogant, defiant, and aggressive spirit of hostility on its side. No great courage is required nowadays to declare a new truth, however hostile it may be to received belief, nor is any serious suffering entailed by the declaration; there is no need therefore for a scientific man to put on the airs of a martyr. He is a very little martyr who is persecuted only by the pens of unfriendly critics, and rather a pitiful object when he sits down by the wayside, and calls upon all them that pass by to behold and see how hardly he is used. It was very different when science first made its voice heard; when, under the cruel persecutions of the inquisition, Galileo unsaid with his tongue truths which his heart could not unsay, and that grand figure in the noble army of scientific martyrs, Giordano Bruno, went calmly and resolutely to the stake rather than utter one word of retraction. The saddest contemplation in the world perhaps is that of the brave who, like him, have died fighting in the battle for the cause that seemed to perish with them; whose lives of suffering and sore travail have set, often through cruel tortures, in black clouds of gloom which no ray of hope could penetrate. Theirs was not the laurel crown of victory after the agony of the struggle; no popular applause, no encouraging shout, greeted their ears as they sank down exhausted in death; the shouts which they heard were shouts of execration, and their crown was the martyr's crown of thorns. We have, happily, fallen on better days; the secrets which we win from nature we may proclaim without fear, and in the confident assurance that, after being proved and tried, they will be accepted; we are fighting a winning fight, and the stars in their courses are with us. What cause, then, for arrogant self-assertion, overbearing aggression, and wilful determination to seek occasions of offence? The advantages of our position and strength entail the responsibility of moderation and forbearance, for the strength is not our own—it is the power of the universe working in us to its higher ends.

One may esteem science duly, then, without feeling sympathy with the aggressive delight with which some persons accentuate its hostility to expiring doctrines, and exult in the overthrow of articles of faith which have sustained and soothed

multitudes of men in the dark hours of life and in the darker hour of death. It can be no pleasure to a generous nature, inevitable though it be, to shatter the faith of even the poor Indian, who, driven from his hunting-grounds by the inexorable fate of a stronger race, looks upwards with feeble faith to a Great Spirit, and forwards with dim hope to the happy hunting-grounds far away where the sun goes down. To aspire to be the first to proclaim the downfall of a position of refuge to which men have clung with passionate earnestness for many generations seems to show "a pitiful ambition in the fool who uses it," a singular blindness to the essential continuity of development, a strange ignorance of what is the final end of all science. A scientific discovery is a very good thing in its way, but it is only a means to an end after all—the improvement of man's estate—that is to say, his moral and intellectual as well as his material state; and when he who has been happy enough to discover a new mental or a new star or a new cell or a new salt magnifies himself mightily, and fondly dreams of an immortal fame, one cannot help some such feeling of the ludicrous as would be raised by the spectacle of a hodsman who, having carried his brick to the building in course of construction, should call upon all the world to take notice of the wonderful work which he had done in architecture. Science has yet to realise, at any rate its cultivators seem oftentimes to forget, that its end must be constructive; that after analysis must come synthesis; that all the analytical work in the world will leave matters in a chaotic state until the constructive spirit, moving over their surface, shall organise the incoherent results, and make them serve for a higher social development. The problem is to make straight in the future a highway over which mankind may pass to a higher life. The philosopher who, with far-reaching eye, overlooks the relations of sciences; the poet who reveals subtleties of human feeling, gives lofty utterance to human sympathies with nature, and infuses nobler aspirations into men; the preacher of human brotherhood who, inspired with strong moral feeling, proclaims the lessons of self-renunciation and of duty to neighbor; these are brighter stars in the firmament of human genius than the scientific discoverer. The discovery of the law of gravitation is the grandest attainment of scientific thought; but can we justly compare the effects of that generalisation upon human interests and happiness with the elevating influence which is exerted by the poetry of Isaiah or of Shakespeare upon multitudes throughout the world; which is perhaps being felt at this very moment by fireside or on sick-bed in distant lands—by the solitary dweller on the skirts of the vast forests of Western America, in the great lone land of Canada, in the farthest depths of the Australian bush? Science has not rendered the philosopher, the poet, and the moral teacher superfluous, nor will it ever supersede them; on the contrary, it will have need of them to attain to its own perfect working to the bettering of man's estate; and it may well seem to some that the time has come when its manifold scattered and somewhat anarchical results should be penetrated by the synthetic insight of the philosopher, be embodied in forms of beauty by the poet's imagination, and utilised by the moral teacher to guide and promote the progress of mankind. So long as man sees splendor in the starry heavens, beauty in the aspects of na-

ture, grandeur and glory in self-sacrifice, so long will he feel that his brief conscious life is but a momentary wavelet on the vast ocean of the unconscious; that there is in him the yearning of something deeper than knowledge, which "cometh from afar," and which the labored acquisitions of science will ever fail to satisfy.

## Original Papers.

### ON CHRONIC ULCER OF THE STOMACH.

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(Concluded from November No., p. 495.)

OF the examples recorded, five out of the six were in females; bearing out what has already been said of the very decided proclivity of that sex to the disease. Their ages ranged between twenty and forty; and all were of notably anæmic aspect, and had previously been out of health. The young woman Caroline T— looked less cachectic and presented a more normal appearance than any of the others. The second and third cases had lost flesh and looked somewhat emaciated, but the same remark could hardly be applied to the others. Thinness and wasting are by no means the invariable concomitants in this affection; indeed, it may obtain in those who are plump, fully furnished, and who do not give outward evidence of organic mischief. When, however, the ulcerated surfaces are extensive and the process has been long continued, the patient loses volume, is flabby, and exhibits declension of strength and change in the organism. It sometimes happens, however, that cases are presented in which the emaciation has gone on to an extreme degree, and in such examples we are inclined to suspect malignancy; the negative facts, such as the non-existence of palpable tumour, the clinical history, the age of the patient, with other particulars, will aid in the direction of diagnosis. There is, however, often very great difficulty in pointing out the diagnostic differences between this affection, that of cancer, and that of chronic gastric catarrh; and more especially when the vomiting and sickness have not been considerable, when there has been no hæmorrhage, and when emaciation does not obtain. Again, the same kind of uncertainty is felt in chlorotic young women who labor under dyspepsia, who are subject to cardialgia, whose uterine functions are irregular, and who complain of variously located neuralgic pains. The physician may, perhaps, in such perplexing instances be somewhat guided in his judgment by a strict observance of the nocturia or juvenilia. The continuous and careful employment of alkalies, if followed by benefit, would naturally indicate the probabilities as to the nature of the disease existent. In all the instances of this malady it will be found that the prominent subjective symptom is that of *pain*, which is described under varying degrees of expression and differing figurative epithets. Sometimes we are told it is a constant, wearying, grinding, and sore

pain, or a dull aching sense of uneasiness, which at intervals, and more especially after food, becomes increased; some speak of it as tearing or burning; and others use terms to signify its sudden, sharp, and stabbing character. In some examples the patient refers its seat to the entire epigastric region; but, according to my own experience, it is more frequently ascribed to a given and limited space, especially at the situation immediately below the ensiform cartilage. It is not uncommon for darting and lancinating stabs to be felt through, high up, as far as the interscapular space, or at the lowest dorsal and first lumbar vertebræ; and sometimes the pain radiates towards the hypochondria or umbilicus. In these cases all complained of pain after eating, and in particular at the circumscribed locality just named. The attacks of gastrodynia seemed to be not a little modified by the kinds of ingesta, and it will be found, as a rule, that rough and solid food most readily provokes suffering. There is generally, as the accompaniment, more or less of pyrosis; and not unfrequently, as in malignancy, the eructations are copious, persistent, and sour. The gastrorrhœa will vary much, according to the kind of nutrients which are taken; in other words, correlatively with the stimulus or excitation given to the digestive surface. In passing, it may be observed that in some exceptional instances the introduction of food into the stomach for a time seems to arrest or mitigate the gnawing sensation experienced; but I think such very exceptional, and the contrary is quite the rule. In the great majority of examples there is greater or less immunity from pain when the organ is empty. In mere cardialgia and spasmodic attacks at the epigastrium pressure will often confer a kind of comfort, or at least not augment the suffering. In ulcerations of the gastric surface even slight manipulation gives rise to tenderness, and it sometimes happens that the localised soreness is so excessive that the least touch is instantly complained of, nothing tight can be worn round the waist, and sometimes even the mere weight of the bed-clothes cannot be borne. In young, nervous, and sensitive women these kinds of instances are, though with some rareness, observed; and still more exceptionally in such patients the pain may be so acute as to give rise to syncope or epileptoid seizures, and some writers have said that such events are most prone to supervene during the catamenial period. When the pain seems to come on with or immediately after a meal, emesis will not infrequently give sudden relief, and there may then be comparative comfort experienced for some hours. The organ then becomes relieved of its burden, its physiological action is not excited, and its quiescence does not provoke suffering. It must be held in mind that this symptom, pain, is not an infallible index to the extent and seriousness of the malady; because such symptom may have obtained in great or even in distressing degree, and have been of long continuance, and recovery eventuate; and because in certain exceptional cases it may have been neither marked nor absolute—when a mere sore, dull uneasiness has been experienced,—and yet a sudden and fatal issue has eventuated. The intensity of the paroxysms, doubtless, depends mainly upon the greater or less invasion of the nerves in the course of the ulcer, just as hæmorrhage depends on the greater or less crossing of vascular branches at the

seat of ulceration. The reader may here also be reminded that pain to some degree may remain as an irremediable and abiding result after healing and cicatrisation have taken place. There may be left such puckering up of the gastric tunics as to markedly narrow the cavity of the organ at one particular part; and as these ulcers almost invariably elect the smaller curvature and the vicinity of the pyloric orifice, it is by no means impossible, and is indeed sometimes the fact, that permanent stricture is established, which is not only rendered a constant source of pain, but may also be such as to effect an amount of narrowing which so interferes with digestion and nutrition as to bring on gradual wasting and at length death; or the digestion may only be affected in a modified manner, and the greater end of the stomach, by the partial obstruction, may become unequally and unsymmetrically dilated, when a rounded fulness of contour is the outward and tangible effect at the epigastrium. Some sparse examples of what is now described are to be found recorded in the literature of this subject; and certain pathologists have named this kind of stricture as the hour-glass form of contraction. From what has now been said, it is evident that a right estimate is always to be made of this symptom, and its kind and quality to be considered as the aim in diagnosis. There is pain in gastric catarrh; but in gastric catarrh the feeling of discomfort and uneasiness is more diffused and not so acute. In mere cardialgic attacks attention to the ingesta will ere long point to the real nature of the ailment. In the obstruction consequent upon inspissated bile and gall-stones, the mode of accession, the concomitant conditions pointing to hepatic disorder, and the often sudden and final cessation of the suffering, will guide our decision. Again, other negative as well as positive facts will aid in the conduction to a correct inference. Ziemssen says it is often associated with tuberculosis and chronic pneumonia, and also that affections of the endocardium have been known simultaneously to occur; and Siebert refers the primary cause to derangement of the nerves proper to the stomach, whereby vascular circulation and the nutrition of the organ are in due order morbidly influenced.

In all these cases there were *sickness and vomiting*. In the young lady, the third example given, such obtained in a very aggravated degree, nor did any remedies prove of much avail. The suffering thus produced was very distressing. Towards the end of her illness the simplest and blandest nutrients could not be retained. This constant irritability of the organ, and at length its non-retention of food or liquids, ushered in the beginning of the end; emaciation and loss of strength became more and more marked, until vitality was, as I have said, slowly but gradually extinguished. Vomiting has, and correctly, been considered to stand next in frequency to pain. There are, however, as if to prove the rule, some very exceptional cases from time to time observed in which sickness hardly, or at all, comes on. So far as my own experience extends, I have never known one instance of this disease in which nausea or vomiting had been absent. The time after food at which the organ's ejection of its contents occurs differs. If the ulceration happen to be near the cardiac opening it is likely to come on quickly after the ingesta have been taken; if in proximity with the pyloric end, an interval of some time may

intervene—that is, when the digestive process shall have progressed, and the contents begin to pass into the duodenum. It is worthy of note that in these few cases, where it is presumptive the ulcer is towards the cardiac end, there is a simple ulcer, absence of dysphagia, the œsophagus maintains its action, which is unlike that which occurs when there is malignancy at the cardiac orifice. There is now in one of my beds in the infirmary a woman between thirty and forty years of age who has the most suspicious symptoms of carcinoma at the lower end of the œsophageal tube. She came into the institution greatly emaciated; the sickness was immediate after the attempt to swallow food, and she complained of constant and deep-seated pain at the pit of the stomach. Mr. Cleland Lammiman, the house-surgeon, attempted the introduction of the tube of the stomach-pump, but the end would not pass into the stomach. He dexterously succeeded, however, in getting the end of a thinner bougie to pass beyond the stricture, and, in the course of time, such dilatation has been effected that a much larger tube will now pass into the cavity. She can now take a tolerable amount of nourishment, and her appearance has greatly improved. But the prognosis renders ultimate recovery very doubtful; and I have here incidentally mentioned the case of this woman because sickness has been, and still is, a prominent symptom, yet the case is evidently not mere gastric ulcer. To resume from this digression. It is quite in accordance with physiological experiments and the observance of facts that ulceration of, or near one of, these outlets is more likely to give rise to this so-called anti-peristaltic action. The terminal filaments of the pneumogastric there receiving irritation and excessive stimulus, those wave-like contractions of the muscular walls of the digestive tube generally arise with more force; and through the sympathetic influence of the nervous system the associated movements of the abdominal muscles and the diaphragm come into play, and the organ is relieved of its contents. Hænoch has aptly observed that attention to this fact holds good with regard to other hollow organs; that reflex movements are prone to supervene when there is localised irritation near their openings, as when such is present at the neck of the bladder, or when tenesmus is produced by some disease in the rectum or at the anus. Vomiting is a reflex function—the pneumogastric filaments being the efferent nerves, the medulla oblongata and cord the excitable centres—and becomes an excito-motor act by the kind of local stimulus which this disease confers. The ejected matters will, of course, in their character partake very much of the last kind of nourishment which has been taken, and will be influenced according to the time to which they have been subjected to the gastric secretions. They may consist of food slightly altered, of acid or neutral fluids, mixed more or less with mucus or blood, and the microscope not unfrequently detects epithelial scales, pieces of elastic fibres, or those parcel-like formations which Goodsir discovered and named *sarcina ventriculi*. In those instances of chronic ulcer of long standing, and in which sour eructations have been a persistent and troublesome symptom, the epitheliums covering in the mouth becomes removed, and the tongue is rendered red, fleshy, and fissured, and with these conditions there is generally great thirst.

In four out of these six recorded examples *hæmorrhage* came on in most alarming degree, and in one, as it has been seen, was rapidly followed by a fatal issue. This event is so characteristic of ulceration in this cavity as by some to be regarded as a pathognomonic symptom; but it can hardly thus be considered, as blood from varying parts may pass out of the stomach when there is even no abrasion of the gastric lining; or it may be capillary exudation, and even profuse. The loss of blood from the ulceration now spoken of may be quite insignificant; it may be a mere exudation or in trifling amount from the crossing of the extreme vascular terminations in the sub-mucous tissue, and under the control of the ordinary astringent remedies. Sometimes, as Cruvelhier and Frerichs have remarked, it may come on in active manner when the general venous system of the stomach is rendered hyperæmic and turgid, as it sometimes is from splenic and portal engorgement. And thus if there be obstruction of the liver or spleen simultaneous with this affection, the event of hæmorrhage becomes far more probable, and may be looked for in great excess, and when such organs are relieved of their turgor the *gastrorrhagia* subsides. It may be held in remembrance that in chlorosis there is increased friability of the vascular walls. When the ulcerative process happens to invade one of the larger trunks of the gastric arteries, very copious amounts of blood are then with much suddenness poured into the cavity of the viscus. The gastric, pancreaticoduodenal, coronarise ventriculi, gastro-epiploica dextra, splenic, or hepatic arteries, or even the portal vein, may thus be opened. This contingency is generally such as to induce the final cessation of the heart's action. According to Murchison, when one of these branches is but minutely perforated, fatal hæmatemesis may ensue. And it has been shown by examination after death that the orifice from whence such a large outpour of the vital fluid issued was as minute as to be hardly discoverable. Of fifty-two fatal cases collected by Brinton, in twenty-four the ulcer was seated at the smaller curvature, in seventeen in the posterior surface, in six at the pyloric end, and only in two on the outer surface. In the fifth case now given the place of perforation and fatal hæmorrhage was at this very exceptional situation, at the anterior surface of the larger curvature. Again, in certain of the more chronic cases, in which morbid union has eventuated between the ulcer and adjacent structures, as when it becomes attached to the left lobe of the liver, the pancreas, or omentum, rupture of the vessels proper to such structures may by the extension of this morbid process give way, each in the same termination. A full meal, coughing, vomiting, or straining at stool, may be followed by hæmorrhage. In the first of the above cases, when the hæmorrhage came on the lady described the sudden and peculiar feelings which she experienced as a sense of "coldness and fluttering at the pit of the stomach." She soon afterwards complained of being "chilly and faint," and in no great length of time sickness came on, and to her dismay she threw up a quantity of pure blood. Very similar descriptions were given of the first feelings of this event by the next patient. She had also a sensation of fluttering and fullness at the stomach. In the last recorded example the pulse, countenance, and general appearance of the patient gave indication each time



when the blood began to be poured into the stomach, as soon afterwards more blood was vomited. This lady, prior to the return of ejection, by her peculiar feelings at the epigastrium, expressed a certainty of a recurrence of the vomiting. When such large losses of blood take place in the organ, more or less is always passed by stool. The evacuations for many days may present a tarry or pitchy appearance, and not unfrequently the dejections are rendered extremely offensive. The color of the blood vomited is by no means of uniform appearance. Sometimes it is a light scarlet fluid, evidently showing its unmixed arterial quality; in other instances it becomes acted upon by the gastric secretions, or it may be by the medicines administered, and if it should for some time collect and lie in the cavity, it may be ejected in the form of a dark or grumous liquid or in black coagula. The presence of these coagula, as I have remarked, seems indicated by a sense of weight and oppression at the epigastrium. Sometimes they give rise to a feeling of coldness, and there is no doubt that more or less of the fluid thus removed from the circulation becomes digested. Lastly, in speaking of this symptom, when we have reason to regard the case as one of ulceration of the stomach, and when sudden prostration comes on, with pallor of the countenance, feebleness of the pulse, loss of heat at the surface, impaired vision, and tendency to syncope, it then becomes exceedingly presumptive that hæmorrhage has taken place, though no vomiting of blood reveals the fact; and in such instances the alvine evacuations should be carefully examined. It may here be observed, as a matter of great practical importance, that cases sometimes are seen in which, in the manner spoken of, there are great losses of blood when hæmorrhage is not even suspected. The practitioner may be hastily sent for, most likely in the case of a cachectic and anæmic woman, or a pale and delicate-looking man, who is reported to have fainted, and on arrival there may be all the conditions of absolute syncope. It is related that such a one had for some time lost color and been out of health, but complained of no pain, and had only been affected with weakness. There may have been no sickness, no vomiting, no epigastric uneasiness, nor any other localised suffering. We are told that giddiness, dimness of sight, and fainting came on without any apparent cause, and it may be that the same condition of things, within no great length of time, had occurred before. On subsequent examination of the thorax, the physical signs are natural, with the exception of a weak and over-exerted heart; no tumour, no tenderness, nor anything palpably abnormal, can be discerned in the abdomen. The cause of this unaccounted-for occurrence is vaguely and unsatisfactorily referred to general debility. In such instances we should always be suspicious of the loss of blood into the alimentary canal: the bleeding orifice may be within the gastric cavity, and yet no vomiting; or it may be from ulceration in the duodenum, the colon, or other part of the lining membrane of the intestines; and the solution of the difficulty often alone lies in examination of the stools, when melanotic evacuations tell the tale of the real cause of that which had been ambiguous and ill understood. I am quite sure that attacks of the kind spoken of more frequently occur than is generally supposed; and I repeat, in faintings and syncope thus spontaneously coming

on, the evidence to be gained by the dejections should never be omitted.

The kind of ulcer now described is very rarely of the acute, but nearly always of the chronic form; and it is generally single; there may, however, be two or three, or even a greater number, but such instances are exceptional, and when there is a plurality of them they are generally situate near each other, most frequently at the posterior surface and at the pyloric end. Nor is it an uncommon thing to detect the cicatrices of similar and foregoing places of lesion: these indications may be a mere trifling loss of the villous coat or white lines; or there may have been such an amount of destruction of the mucous and muscular coats as to have left a puckering-up and an irregular folding of the walls, and when such places are viewed on the peritoneal aspect the serous membrane is to be observed crumpled and wrinkled, or in radiating or stellate lines. It is thus that in extreme instances of this kind of contraction the shape and contour of the organ may become very greatly or even fatally altered. The internal surfaces at some particular point may approximate and only leave a tortuous and contracted passage, and thus the patient may finally sink from sheer inanition; and such event, it may be remarked, is nearly always at the pyloric portion of the stomach. Again, this resulting approximation of the parietes, by producing contraction of one part, is apt to render the remainder of the organ sacculated or largely and unsymmetrically distended, and thus an abiding condition of discomfort and impaired health are the inevitable consequences. And with such changes, violent cardiac pains are common accompaniments.

The cause of gastric ulcer and the site which it elects have, and justly, been held in dispute by pathologists; nor is it to be wondered at that there should be a want of consentaneousness of opinion relative to those questions, because, as in many other problems arising out of the lesion of internal parts where neither ocular demonstration nor direct experiment can be brought to bear, as in the investigation of diseased structures where the morbid phenomena can be observed, such is necessarily left to vague hypotheses and individual ways of thinking. Some have asserted that the first cognisable change in the gastric surface is a slight and demarcated shrinking of the mucous coat, with more or less of vascularity in the subvillous tissue; and their descriptions have inclined to the notion that the initiative and fundamental alteration is of a congestive and inflammatory kind, whereby the nutrition would necessarily become affected. Such, however, rather belongs to those generally entertained doctrines which ascribed so much in the causation of most diseases to an origin of inflammation; but these views, with a profounder, a more exact, and demonstrable pathology, are now considered untenable. Virchow regards the first condition in the process of this affection as an arrestment in the circulation through a sufficient depth of the gastric tissues as to allow the destructive power of the gastric juice to be exerted on such part, when the blood is there deprived of its naturally opposing quality—that is, its normal alkalinity; and, in confirmation of this notion, ligation and embolism of the gastric arteries have shown that under such obstructive circumstances the solvent action of the gastric juice will dissolve not only dead portions of the stomach wall, but

also parts which are not necrosed but whose vitality is lowered. In favor of this theory it has also been remarked that these ulcers are more liable to be located in that part of the digestive canal which lies above the reach of the alkaline bile. It has before been insisted upon that the ailment now considered is most liable to occur in the chlorotic and cachectic, in whom there is blood-lesion, and consequently a lowered vitality, as more particularly taking place when there are derangements of nutrition during puberty; and hence it is doubtless a localised effect of the want of normal vitalism in an organ in which the nerves proper to such part are implicated, and thus the degraded change spoken of, which renders the otherwise resistive tissue a prey to the gastric acid. As Wilks and Moxon remark, the cause of this ulceration may be somewhat analogous to the cause of ulceration of the cornea, which comes on in a debased state of the system and a general lowering of its vitality. We know, as already observed, that embolism in the liver, spleen, brain, and other organs is followed by circumscribed decay; and, by a parity of reasoning, embolia in the arteries of the stomach may be followed by a like phenomenon. It has, however, been pointed out, in opposition to this theory, that in many cases of broadly diffused embolism of other organs embolism of the stomach has not been found. Virchow, however, believes embolism to be the most frequent cause; and he also thinks that obstruction in the portal veins, fatty degeneration of the arteries, and mechanical injury sustained by the vessels in vomiting, are prominently to be enumerated. And thrombosis and the atheromatous and amyloid changes may doubtless be added as primary and remote causes. This high authority also comments on the fact that the configuration and position of these ulcers incline to the notion of their being primarily of arterial origin, and that their conical form resembles what occurs in embolism in other parts.

All authorities agree that gastric ulcer is most frequently found at the posterior surface of the organ, and next in frequency of its site is the lesser curvature and at or near the pylorus, for which it seems to have a sort of elective affinity. As already remarked, it is very seldom observed on the anterior surface, the greater curvature, or the cardiac end. Some have endeavored to account for this election of the pyloric portion and smaller curvature by the greater fixity of the organ at this part, and thus its increased liability to irritation; but such would hardly explain the peculiarity. We know that carcinoma is far more prone to appear at certain parts of the alimentary canal than in other portions of its course, and that in the vast majority of instances it is detected either at the pylorus, the ileo-cæcal valve, the sigmoid flexure, or the rectum, and that the intervening spaces possess comparatively an immunity. In other organs and tissues we know there is a kind of preferential caprice in their lesions which is difficult of explanation. It is, perhaps, much dependent upon vaso-motor influence. The diameter of these ulcers varies from a quarter of an inch, it is said by some, to the extent of a space equal to the palm of the hand. From my own experience I should say they are by far most commonly noticed from the size of a fourpenny-piece to that of a half-crown, and, when larger, very probably two or three have coalesced. They are mostly

round or ovoid, and only sometimes of irregular outline, and when noticed from the inner surface they have a punched or stamped appearance, the outer edges being smooth, clearly defined, and as if vertically cut. Within they are funnel-shaped, the cone pointing towards the serous membrane, and if more minutely examined when they have become chronic and when absorption has taken place, their interior often exhibits, as I have already said, a kind of crater-like or terrace formation. The margins may be greyish, pale-red, or brown, and sometimes small dark coagula are adherent to their borders. The edges, as a rule, are well defined, and there the submucous tissues may be rendered thick, harder than normal, and more or less elevated above the surrounding surface. The ulcerative process is sometimes discovered to have so far progressed as to have extended fully down to the serous covering, when the thin peritoneal coat alone maintains the integrity of the organ, and thus life is imperilled by the occurrence of some trifling or fortuitous circumstance, whereby a rent in this attenuated tissue might be effected, such as a slight blow, a full meal, or straining at stool. When the serous coat thus gives way, as in the instance recorded, the opening looks like a clean-punched hole without any fringing or lapping at the edges. Sometimes the peritoneum, after having been denuded of its coverings from within—a condition which first takes place in the centre of the cone,—becomes vascular, opalescent, and at length a yellow slough is formed, which either partially separates spontaneously, or is partly or entirely displaced by some extra exertion, sudden distension, or slight mechanical force in some other way applied, and thus perforation is effected. When the ulceration is on the posterior aspect of the stomach, and the peritoneum becomes irritated, lymph is thrown out on the free surface of the membrane, and agglutination with some neighboring organ or structure may eventuate, as to the left lobe of the liver, the pancreas, the omentum, spleen, or certain lymphatic glands. And the result of this may be, and not very unfrequently is, conservative, by preventing the extrusion of the contents of the stomach into the great serous sac, and thus ushering in a fatal catastrophe. The fibro-cellular formation in the course of time may impart a thickness to the organ to which such union has taken place, and such organ be in no otherwise affected. But pathological changes of a different kind may eventuate. This union having come to pass, circumscribed peritonitis is the consequence, and the partially inflamed peritoneum is rendered over a greater or less area vascular, tumid, and adherent. It may give rise to inflammation of the diaphragmatic pleura, and thus symmetrical pleuro-pneumonia may be established at both bases, and all the ordinary phenomena of the physical signs be rendered present. The morbid coalescence to internal parts spoken of may be only temporary, as the neoplastic connective tissue may after a time give way; it may become soft, absorbed, and lack the power of organisation, and thus rupture has only been for a time warded off, and not permanently prevented. The effused product, however, may assume the characteristics of a fibro-cartilaginous substance when the blocking up of the breach of continuity is effectually secured. It is a curious pathological sequence, and one which has been commented upon, that in this disease, when the ulceration has extended through

the serous membrane, it takes on a suppurative tendency, when the matter may burrow through the diaphragm into the thoracic cavity, where it has been known to be followed by a gangrenous condition of the pulmonary substance; or it may, in seeking an outlet, penetrate some part of the intestinal tube, or pass through the abdominal wall, and thus establish gastric fistula. It is possible that diffuse and flagrant peritonitis may be set up, when the intestines and solid organs have been found matted together, and the entire serous membrane revealing all the usual conditions of its ordinary inflammation. Such, however, in these cases is exceptional, because the blood is not such as to readily give off the commonly seen effusive products, and because such inflammatory phenomena as take place are of the asthenic type.

Perforation is much more likely to occur when the ulcer is on the anterior aspect of the stomach, as in the case narrated. When there situate there is less chance of adhesions, as the mobility of the diaphragm and the abdominal walls opposes this kind of union, and its occurrence in this position is necessarily fatal. The cause of death in such event may be from the sudden shock which the system sustains by an outpour of ingesta and gastric fluids into this great cavity; or the place of opening may happen to lacerate one or more arterial branches, and the hæmorrhage be such as at once to destroy; or diffuse peritonitis, as before remarked, may be instituted. In the eruption of such an amount of extraneous products, the great splanchnic nerves, and the cardiac plexus in especial, may become so gravely impressed and subdued as speedily to arrest the heart's action; and more likely would such be the case in a patient who had long suffered from this disease, and who was perhaps debilitated by previous losses of blood. Again, in such an instance the hæmorrhage is favored by the already existent blood lesion, and that defibrinated state to which the vital fluid has been reduced, and thus a less outpour may be fatal than in other cases in which hæmatemesis is produced from other causes. It may not inaptly here be remarked, when there is solution of continuity of the peritoneal covering of the stomach in cancer the process is slow, most rarely sudden, and very exceptionally so as to allow of the extrusion of the contents of the organ. In malignancy the growth may destroy the diaphanous investment, but this destruction is a gradual process, and the effused product solders up an orifice which would otherwise be fatal.

In saying a word on the *diagnosis*, it can hardly be contested that there is, and not infrequently, not a little difficulty in coming to a decision as to whether this complaint be or be not present. In a large number of diseases with which the physician has to deal there are certain cognisable, significant, and well-understood conditions, which, when thrown into the scale of evidence, leave no doubt on the mind as to the nature of the malady. In this affection it often happens that such precise and absolute conclusions are not to be arrived at. As regards the ailments incident to the three great cavities, something of hesitation and doubt must always qualify our opinions. And as pertains to ulcer of the stomach these observations are particularly applicable, because its prominent and distinguishing symptoms are, each and all, the leading symptoms of other forms of disease; because none can be strictly regarded as

pathognomonic; and because one or more of what are deemed cardinal symptoms by which it is more commonly recognised may be but slightly pronounced or entirely wanting. In illustration of what is now maintained, to take the symptom *pain*: it may be felt, and in a very characteristic manner, at the place where it is very generally experienced in gastric ulcer, and yet be dependent upon other causes; it may be there from simple irritation of the lining membrane when there is even no abrasion of the gastric surface; it may be from mere offending ingesta; it may come and go with intervals of freedom, precisely as we know such to be the case in this ulceration, and be only gastralgia. Chronic gastritis with gastrorrhœa will produce pain at the ensiform space; obstruction or narrowing of the biliary ducts, and aneurism and other deep-seated tumours, sometimes give rise to epigastric pain, which may come on paroxysmally and bear much similarity to the pain caused by the disease now considered. Again, in that form of cancer which is spread over the gastric membrane, which is called *cancer en nappe*, and which cannot by palpation be discovered, there may be epigastric pain; and also in malignancy at the pylorus, when the tumour cannot be felt, as is sometimes the case, pain may be there experienced. Pain, then, is insufficient for diagnosis. A good deal of the same kind of reasoning might be observed with regard to *sickness* and *vomiting*, which are the symptoms and effects of various other causes than gastric ulcer. They may be from ingesta or other irritants carried into the organ, as in cardialgia; from gastritis; and from malignancy. Violent neuralgia will give rise to sickness and vomiting. In cancer, these symptoms may come on after longer or shorter intervals, just as in simple ulcer. In both affections they may not, from first to last, be very marked nor yet very recurrent. Neither the frequency of the ejections nor the matter ejected will alone suffice to be our guide. In a simple ulcer, as in cancer, the contents may in varying degree be mixed with blood; and in both affections there may be that kind of oesophageal regurgitation which indicates the presence of organic disease. And, once more, to speak in this manner of *hæmatemesis*, which, although a very constant symptom of gastric ulcer, is not in every case present. Again, vomiting of blood may be produced by a variety of causes in addition to that of ulceration. Blood sometimes comes from the stomach, as if vicariously, on the cessation of hæmorrhoids and during the irregularities of the catamenia; and we also know that, under other and less understood conditions of the system, blood may proceed from the gastric membrane in those of hæmorrhagic tendency, just as epistaxis may supervene on puberty or adolescence. In acute gastritis there may be bleeding from this source; and in splenic and portal congestion sanguineous fluid, and sometimes to a large extent, may be regurgitated into this cavity and ejected. And in cancer of the stomach periodic losses of blood, more especially when this disease has made considerable progress, are by no means uncommon. In this affection, when it assumes a slowly advancing and an insidious form, and when the tumour is small or may not at all be recognised, losses of blood may come on, and considerable intervals intervene, without much emaciation, and this may closely resemble gastric ulcer. The

best rules for our guidance will be a general review of all the positive as well as negative facts. When, on careful examination, no tumour can be felt in the pyloric region; if there be alternations in the pain; if food seem to bring it on, and there be repugnance to food because it gives discomfort; and if there be, more especially in pale and anæmic women, a craving and capricious appetite, and the epigastric uneasiness continue so long as the digestion is carried on; if the pain dart up behind the sternum and through to the back or into the hypochondria, and is increased on moderate pressure over the stomach; if there be vomiting of blood, which may also be of the coffee-grounds character or black vomit; if there be occasionally melanotic stools; and if there be general wasting and loss of strength,—such indications are exceedingly presumptive of ulceration. In cancer, the tumour can, as a rule, be felt: if at the pylorus, it can mostly be discovered near, or as if passing under, the right costal edge; and if at the cardiac end, the situation of the enlargement will vary with the emptiness or fullness of the stomach. In cancer, the wasting and cachexia are more marked, and the features will sometimes assume the aspect of old, whitish, yellowish wax; and the clinical history, sex, and age of the patient would in some measure modify our opinion. In ulcer of the stomach, there may not be much loss of flesh; and, as before remarked, the tongue sometimes looks preternaturally red and clean, and there is much thirst.

In making, in conclusion, a few general remarks pertaining to the *treatment* of this affection, it is needful with emphasis to insist that the strict observance of rest and quiet is a consideration which should precede the adoption of all other rules and remedies; and by these terms should be implied the physiological rest of the organ, as well as the abstention from all unnecessary activity of the voluntary muscular system. That movement to which the stomach is stimulated in the process of digestion should be kept as subdued and passive as possible, in order that reparation may be carried on in the part or parts of lesion, or in other words, that cicatrization may be formed. The active motion and the distension of the organ must of necessity tear apart new bonds of union, and hence those granular formations which in their reparative efforts are effecting the healing up of the sore, are broken down or swept away, and the ulcerative surface continues, precisely as when the same morbid action obtains in other and more apparent parts of the body, and when motion prevents the cohesion of or growing up of surfaces. The strength of the system in general should be conserved as much as possible, and tissue-waste reduced to a minimum. In briefly enumerating the most important of the therapeutic agents, opium and the nitrate of silver, which may be given separately or together in a pill, doubtless in many cases are followed by much benefit. The powder or extract of opium may be given, or the acetate or hydrochlorate of morphia in small doses, and continued at regular intervals, whereby the functional activity of the organ becomes lessened. The hypodermic administration of morphia sometimes avails. The nitrate of silver doubtless acts in a manner similar to its ordinary effects when applied to more tangible and obvious places of ulceration. Indian hemp and the compound kino powder have by some been employed with success.

Alum, tannic acid, and the acetate of lead are often serviceable. The subnitrate of bismuth I believe to be a valuable remedy in this affection; it should be ordered with mucilage, and as the patient progresses it may be combined with some bitter infusion, as those of calumba and gentian. While there is much pain, fomentions, cataplasms, sinapisms, turpentine stupes, and the external application of opium generally give ease, in addition to internal remedies. Perfect quiet and the horizontal position, with warm clothing and coverings, should at the same time be enjoined. The stomach may be kept warm with flannels and lint. When there is much sickness the carbonates of soda and potash with hydrocyanic acid I have generally found of service, or not infrequently a large opiate will allay this symptom. Ice may then be given. In hæmorrhage the most efficacious medicines are rhatany, sulphuric acid, gallic acid, turpentine, and the tincture of the perchloride of iron. In many cases the gallic acid is much to be depended upon, or if it should fail, half-drachm doses of the tincture of perchloride of iron may, during great urgency, be given in iced water every two or three hours; and I have sometimes known a large opiate succeed. I have been informed, but cannot speak from experience, that in such attacks of hæmorrhage as are uninfluenced by the more commonly employed agents large and repeated doses of neat brandy are not unlikely to be followed by its arrestment. When the loss of blood has been alarming, I have not hesitated to try a gutta-percha bag of ice applied to the epigastrium. In such cases, however, where there is extreme exsanguination, where the cardiac impulse is weak and fluttering and the pulse quick and feeble, with perhaps a syncope tendency, caution in the mode of using cold is needed, for, if this were employed continuously and in excessive manner, its sedative effect might be such as to gravely subdue the heart's action. There are not, however, those objections to this way of applying ice which there are in hæmoptysis, and in cases of imminent peril it should be tried. Warm applications ought at the same time to be made to the feet and legs. In the event of that terrible occurrence, perforation, though we then feel that little or nothing can be done to avert the fatal issue, yet, as there is generally excessive pain, our endeavors should be exerted to mitigate suffering. A large bran poultice, which is not so heavy as linseed meal, may be placed on the abdomen; and the best mode of doing this is to put the bran into a flannel bag, and a teaspoonful of laudanum should be sprinkled upon it, and if a large piece of oil-silk or gutta-percha sheeting be carried fully beyond its edges it will keep warm much longer than otherwise, and thus save the patient from the discomfort of so much changing. Full doses of opium should at the same time be administered internally, if only with a view to euthanasia. Such is the best and really the only efficacious method to give relief for the few hours which then life lasts. In all instances of gastric ulcer, it is a matter of importance that the bowels be kept in gentle but regular order, and the gastric membrane should be spared as much as possible, and any medicines which might irritate or induce sickness should be sedulously avoided. Enemata are the safest, and these may be merely of gruel or warm water, or, if needful, oil may be added. In many instances, more especially in cases of long standing, and

those in which there has been hæmorrhage, some preparation of iron is needed, which may be conveniently combined with some bitter infusion; and if the heart's action be excited and irritable, digitalis may be conjoined with these.

Our therapeutic endeavors can only be successfully pursued by keeping in view these fundamental and pathologic changes which essentially signalise and mark the course of this complaint. From the want of certitude, which there is in the initiatory stages of the malady, and the analogy which subsists between the earlier cognisable symptoms and the symptoms incident to other forms of disease, prophylactic means can seldom be observed. When chlorosis and anæmia are the concomitants, to improve the blood, to alter and remove these conditions, and favor the process of general and normal nutrition, should be our aim; and not only should medicinal agents be judiciously administered, but dietetic rules should be very stringently enforced. To arrest the fermentative process of retained ingesta, to neutralise abnormal gastric acids, and to stay the solvent and peptic influence of such acids where necrotic changes have taken place, and where new granulations are forming, should be the intention of our remedies. The acids of the stomach should be fully neutralised at least once in twenty-four hours, and every day the contents of the organ should be emptied into the intestines. Such regular and systematic urging forward of the acid chyme would favor the conditions of granular reparation, and give a better chance of the ulcer healing. An aqueous solution of the carbonate of soda well answers the purpose, and this should be taken when the stomach is free from food, and when the saline is likely to come in fuller contact with all parts of the gastric surface. Ziemssen, Jaksch, Oppolzer, and Niemeyer recommend the Karlsbad waters or the Karlsbad salts, which can be artificially made. The spring to which they give the preference is the Sprudel, which analysis has shown to contain the sulphates of soda and potash, the chloride of sodium, and carbonate of lime, with small quantities of carbonate of soda, carbonate of iron, phosphate of alumina and silica. These authorities consider the Glauber salt as by far the most important agent in ulcer of the stomach. The first-named of the above-cited writers thus speaks in reference to this point:—"Glauber's salt is, according to my experience, the alkali which must be regarded as the most important in the therapeutical treatment of ulcer of the stomach, not only because it acts promptly and certainly in evacuating the contents of the stomach into the intestines, but because it at the same time positively checks or prevents the acid fermentation of those contents. In both respects the effect of common salt is similar to that of Glauber's salt, since it also has the property of restraining the fermentation and putrefaction, and at the same time exerts a gently stimulating effect upon the muscular coat of the stomach and intestines. The latter effect is, however, much weaker than that produced by Glauber's salt, and, in the majority of individuals, quite insufficient."\* The sulphate of soda, carbonate of soda, and common salt are considered as the most active ingredients in these waters, and the artificial Karlsbad salts can conveniently and efficiently be prescribed when the patient cannot be sent to the springs. It is the

opinion of the more recent writers on pathology that in gastric ulcer the ingesta are unduly retained in the viscus, and that the same slowness of the organ in passing forwards its contents obtains in gastric catarrh, and with gastric catarrh there is, as the rule, intense acidity. Under this perversion of peristaltic and secretory function, the hydro-carbonates, such as fat, saccharine compounds, rich pastry, beer, and other articles of food, readily produce the butyric, lactic, and acetic acids, which favor fermentation, arrest digestion, and give opportunity to solvent and peptic effects on the new granulations at the floor of the ulcer, which has become denuded of its epithelial covering, and, consequently, is more liable to be injuriously operated upon by abnormal agents. And if these views be true, the use of these remedies can at once be comprehended.

With regard to food, it should be given at short intervals, and protracted periods of fasting should always be carefully avoided. With long intervals of abstention from nourishment there is the risk of too much being taken at one time. A patient laboring under this disease ought to have something between bed- and breakfast-time; and in more marked cases sustenance should be taken every three or four hours during the night as well as the day. Those light articles of diet should be given which are deemed the most nourishing and easily digested, and which are least likely to give rise to acidity and flatulence. And it is well to observe that the patient ought to keep as much as possible in the recumbent position. All such ailments as may be considered saccharine are to be interdicted, and it is scarcely needful to notice that solids should be strictly forbidden. A single meal of indigestible food might undo the progress made towards amendment of weeks or months, or cause the fatal accident perforation. Those who have seen most of this disease cannot do otherwise than concur in the opinion that rest and diet, rightly directed, are of more consideration than the kind of drugs to be prescribed. Several years ago I was much impressed with the truthfulness of this assertion. I then saw with Mr. Bishop of Tonbridge a young lady who had evidently long labored under gastric ulceration. She had lost flesh and strength, and the stomach had become so intensely irritable that almost everything she took was at once ejected. The most bland and simple forms of nourishment could not be retained, and various medicines had had a full trial. It was decided that one tablespoonful of new milk and one tablespoonful of concentrated beef-tea should be given alternately every half hour. This small quantity of each was retained, the irritability of the organ gradually subsided, and the patient at length made a full recovery. Good milk is one of the best articles of diet which in this disease can be recommended. It does not sometimes agree, but often because too much is taken at one time. It may be mixed with a little corn-flour, arrowroot, or biscuit-powder. In other instances it may be drunk with the addition of lime-water or Carrara-water. Various animal broths and soups, without vegetables, may be ordered, as good beef-tea, Liebig's meat-extract, and veal-and-ham and chicken broths. Jellies can also be given with advantage. Trommer's malt extract has by some been found of service. It is scarcely necessary to observe that broths and soups should never be taken hot, and ordinary tea and coffee had better

\* Geiman: Clin. Med. Lectures, Syd. Soc., p. 61. 1876.

be discontinued. When there is the hæmorrhagic tendency, all descriptions of drink and nourishment should be given cold or iced, and the observance of this rule I generally request for three or four days after the last appearance of blood. In the course of time, when there is evident declension of the more prominent symptoms, the amount of food may be cautiously increased, and the intervals of taking it may be lengthened. Then lightly-boiled eggs, thin toasted bread, well-boiled macaroni, and farinaceous puddings may be ventured upon, or the patient should be impressed with the great necessity which there is for slow and perfect mastication. In regard to stimulants, small quantities of brandy and cold water, or a tablespoonful of whisky and cold water, may be allowed, or moderate amounts of sherry, marsala, burgundy, or claret, and these wines are quite preferable to effervescent and sparkling wines and bottled beer. When such a recommendation can, without inconvenience, be carried out, change of air and climate, by giving a healthy impulse to the system and re-establishing the general powers of the constitution, is most worthy of adoption, and it is worthy of mention to the patient that the waters of Karlsbad, Marienbad, and Taraspor are on the Continent held in considerable repute for their curative properties in this complaint.

Tunbridge Wells.

## EXOPHTHALMIC GOITRE.

By HENRY DAY, M.D., F.R.C.P.,

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WITH our limited knowledge of the physiology and pathology of the nervous system—a system which presides as the directing (originating?) force of every organic function—it is not by any means a matter of surprise that the unsolved problems of practical medicine should be so very numerous.

If it be the case, as indeed I think may fairly be assumed, that the initial cause of our every disorder or disease is to be found in some disturbance of the force above referred to, then may we well watch with an all-absorbing interest those investigations as to nerve-functions which our experimental physiologists are now pushing forward with so much ability, earnestness, and labor; for, until a larger amount of accurate knowledge, a greater weight of stable facts, a more determinate and determinable collection of positive information than we at present possess as to the effects of nerve-function, and the correlation of each special nerve-function on the purposes of *nutrition*, are placed within our reach, a correct interpretation of the phenomena of disease, and with this our ability to successfully treat disease, must necessarily be impeded—may be definitely obstructed by our ignorance.

How much is implied in the frequently-repeated expression—"some error of nutrition"—and yet how little do we know of that force which creates and regulates nutrition. What knowledge have we of the several divisions into which the process of nutrition may be separated? Who can say whether that same much-talked-of "error of nutrition" lies in nutrition as a whole, or whether

the "error" is dependent on a defect in some particular part of it? Is nutrition regulated by special trophic nerves not yet demonstrated, as first surmised by Samuel,\* and subsequently supported by Duchenne, Bärensprung, and others of the same school of thought, or is it carried on independently of any such a system of trophic nerves, by the ordinary nerves of so-called organic life, thus making the nutritive integrity of tissues dependent chiefly on the nerves concerned in their several ordinary functions, as the observations of Vulpian and Phillippeaux would seem to indicate? All important questions these—so important indeed that until satisfactorily answered, our recognition of the causes of disease must inevitably be clouded and uncertain.

Can it be denied—I do not think it fairly can—that the facts of physic are comparatively few? And if so, then assuredly we should not be blind to this other fact—viz., that whatever the study of medicine may have hitherto taught us as to the general characters of disease, it is as nothing when compared with what we have yet to learn as to the essential and primary causes.

What do we know, for instance, of the *cause* of cancer? Recent discussions on cancer have been, it is thought by many, admirable in their fulness and lucidity. Descriptions of its every variety have been elaborated; the morbid appearances of various structures faithfully detailed; histological conditions graphically portrayed; but all this was only an oft-told and well-known tale; whilst it would seem to me to have been more desirable that the effort should have been directed rather to discover the *cause* of cancer than to describe its *characters*. The question should have been, I think, not, what *is* cancer, but what *occasions* it? And here might not disturbed nerve-function, in the matter of nutrition, step in to help us solve the problem?

Every organ, every tissue, must, in virtue of its own inherent force (nerve-function), attract to itself the necessary *elements* for its own maintenance and restoration. A simple error in point of *quantity*, if correct in *quality*, might lead only to hypertrophy, or the production of some homologous or analogous growth; whereas an error in the selection of the elements themselves, an error as to *quality*, would lead, it may be imagined, to the formation of a heterologous product. Just as some seeds sown in a soil not ordinarily their habitat display characters and possess qualities not originally theirs—characters and qualities not common to their ordinary nature; so *elements* not suited to the parts requiring maintenance and restoration may, in like manner, lead to a growth that shall prove destructive to the tissues in the midst of which it is situated.†

We know that cancer, as a rule, appears usually at that time of life when nutrition is difficult of adjustment, and when the balance is, so to speak, easily upset. Now, as a *local* excitant, a blow on the mammary gland might serve, by disturbance of nerve function, as the determining cause of such an error in nutrition as would in some instances, it may be supposed, lead to the *local* selection of *improper elements*, and thus produce a "nidus"

\* Trophischen Nerven. Leipzig, 1860.

† Malignant tumour is formed of a collection of substances which are a new growth in the human body—of abnormal substances which do not exist in the body of the living man.—Dr. G. Buchanan.

eventuating in cancerous and destructive formations. This, however, is but a mere thought in passing.

Again, what positive knowledge have we as to the cause of that distressing condition now called, apparently by common consent, "exophthalmic goitre"? The first description of this affection, I suppose, may be fairly attributed to Demours, in 1818, and Galezowski\* claims for this authority such pre-eminence; but still the affection has received many names in honor of the person who has been supposed to have first noticed and described it. It has been spoken of by Stokes as "Graves' disease," and Emmert gives the credit to Basedow.† But by whomsoever first noticed, it does appear something more than strange that so very peculiar, so distressing, such an absolutely frightful collection of symptoms, should have remained unnoticed, or, if noticed, unreported, until about the period before mentioned. From the very long silence that was maintained, one feels tempted to believe that the malady could scarcely have occurred in times very long gone by, and if such really be the case, then Dr. Richardson might claim it, and properly claim it, as one of the "diseases of modern life." That it is intimately associated with those marvellously intricate nerve conditions termed emotional is, I believe, a pretty generally well-grounded opinion, and certainly for many years past the rate of living of all classes, the excitement attendant upon all that we do, say, or are connected with—the strain, in fact, put upon all our feelings is so great, that "strung up" (if I may use the expression), as the whole nervous system continually is, to a pitch far beyond that which is healthy or natural, may well lead to some unliking of one or more particular parts of it.

Whilst a typical case of this disease necessarily includes the three phenomena of protruded eyeballs, enlarged thyroid gland, and disturbed circulation, yet here, as with other diseases, some of these symptoms may be absent or but imperfectly displayed, and yet the affection, though not present in its entirety, may exist in its *essence*. To such an extent is Trousseau impressed with this idea that he goes so far as to say that you may have instances of the disorder in which there is neither disturbed circulation, protrusion of the eyes, nor enlargement of the thyroid gland.‡ Well, it is a trite saying that you may have the play of *Hamlet* with the principal character omitted, but that you can have that play with *all* the characters left out is calling rather too largely upon the imaginative powers.

It seems to me to be incorrect, and liable to mislead, to call the affection "exophthalmic goitre" unless there be at least the two conditions present from which it derives its name; for unquestionably you may have "goitre" pure and simple, or you may have an exophthalmic state without any goitre whatever, and you may also have, and frequently do have, in hysterical females and others with highly pronounced and excitable emotional feelings, a strongly marked and peculiarly disturbed state of the circulation, not resulting from any absolute alteration of organic structure, but affording nevertheless bruits, murmurs, and thrills,

without there being present either goitre or protruded eyes; yet, to apply to such cases the name of "exophthalmic goitre" would be manifestly improper, neither appealing to our scientific knowledge nor recommending itself to the requirements of a correct nomenclature.

The foregoing observations in no way militate against, or interfere with, the well-known circumstance that this morbid entity has no one settled and unvarying way of commencement and progression. It has no particular period of incubation; it may begin insidiously with feelings of languor and depression, with evident symptoms of mal-assimilation. Or it may occur without any prodromata whatever, and in the most sudden manner. As an instance of this suddenness, a case has been recorded\* in which the whole phenomena of the disease—exophthalmos, goitre, and disturbed circulation—were all created and fully developed in a single night, there having been previously no indication whatever of the approach of such an ailment; and there are other recorded cases in which the suddenness of invasion has been equal to if not exceeding this.

So likewise with regard to the order in which the special symptoms appear, there is nothing invariable. The disturbed circulation may precede the enlargement of the thyroid and the exophthalmos; the goitre may precede the other two symptoms, or the exophthalmos may be the first to make itself evident. And, indeed, speaking as I am doing of that state which is not a resultant of alteration of ultimate organic structure, but simply in the first instance a disturbance of function, I think I may venture to say the mode of attack is uncertain and erratic.

As regards the kind of persons who are generally most prone to suffer from the complaint, the rule is that it is the highly nervous and emotional, although, even in this respect, there have been exceptions somewhat numerous; and whilst it is far more usual, as might be expected, for females to be attacked than males, yet men enjoy no absolute immunity. In the several cases I have seen, and in all those cases I have read of, and which have been typical in their character, the two eyes have protruded *equally*, but the thyroid has not preserved this symmetry of appearance, the right side of the gland being almost invariably the larger of the two.

Over and beyond the above spoken of uncertain manner of attack, it is well to bear in mind that cases do occur which are accompanied by, if they are not actually the product of, alterations of organic structure, and still further it is believed that, in some instances, cases which have in the first instance commenced as merely the effect of disturbed function, have subsequently culminated in organic disease.

In the course of my practice it has been either my good or bad fortune to have met with no less than five well-marked, I may say typical, cases of exophthalmic goitre, and in no two of these did the symptoms display themselves in exactly the same order. They were all females. As two of them have been of quite recent occurrence, and as, whilst affording good examples of the disease, they also serve as illustrations of some of the differences I have endeavored to point out, I will venture to give a brief history of each.

\* *Etude sur le Exophthalmique*, Gaz. des Hop., 1871, p. 428.

† *Historische notiz uber Basedowni, nebst Referat uber 20 selbst beobachtete Falle dieser Krankheit*. Arch. f. Ophthal., xvii., 203.

‡ Trousseau's Clinical Medicine, Syd. Soc. Trans., vol. i., p. 558.

\* Gaz. des Hop., 1863, p. 389.



**CASE 1.**—B. S—, aged twenty-two, a domestic servant, was admitted as an in-patient at the Stafford General Infirmary on Jan. 28th, 1876.

*Family history.*—Father and mother both alive, and enjoying good health. She has several brothers and sisters, and they are, and always have been, healthy. No evidence of any hereditary complaint whatever.

*Previous history.*—In the month of May last year, whilst feeling in every way in her usual health, she noticed that her eyes appeared more prominent than usual. This prominence kept gradually increasing, and a month or two afterwards she discovered a swelling on the right side of the neck, midway between the jaw and the collar bone. About the time she observed the swelling in the neck she began to be troubled with palpitations and shortness of breath; her menstruation also became both scanty and irregular; her appetite failed; she lost both flesh and strength, becoming tired and exhausted by the least exertion. All her symptoms gradually increased in severity, and she became an in-patient at the infirmary on the date already mentioned.

*Condition on admission.*—The first thing that attracted attention was the strange and enormous prominence of the eyes; these appeared as if being fairly pushed out of their sockets. The next feature observed was a very considerable swelling of the thyroid gland, the swelling being much greater on the right than on the left side of the neck, extending indeed from the right side right across the trachea to the left side, where it was not so large. On palpation the swelling communicated to the hand the impulse of the heart in a very marked degree, whilst at the same time a distinct "thrill" was felt. On auscultation over the swelling, there was heard a soft, but somewhat loud, prolonged murmur, as in cirroid aneurism, synchronous with the first sound of the heart. Examining the chest, which, although fairly developed, was very thin as far as glandular structure and flesh were concerned, the impulse of the heart was seen to extend far beyond its natural limit. On percussion the area of dulness was found to be abnormally large, extending from about two inches to the right of the middle line of the sternum, across to a little beyond the spot for the apex beat; vertical dulness nearly three inches. On using the stethoscope a murmur was heard with the systole of the heart; this was heard both at the base and apex. At the base two distinct murmurs were made out, both accompanying the first sound: one (aortic) heard most distinctly at the junction of the second rib with the sternum, on the right; the other (pulmonic?) at the junction of the third rib with the sternum on the left side. The pulse was frequent, but variable as to its frequency, it was also at times intermittent, and much smaller than it might have been expected to be from the violent impulse of the heart. She complained of no pain, said her bowels were regular, but that she had not menstruated for some months previously. Temperature perfectly natural; urine natural; appetite uncertain. She said she had lost much flesh, and that she was easily fatigued. She did not admit that she had suffered from any emotional excitement either before her illness, or since it commenced. Her eyesight was in no way affected; objects either near or distant were seen with great clearness. An ophthalmoscopic examination did not discover any unnatural

condition; the disc was particularly clear and distinct.

*Treatment.*—As she had an anæmic appearance, she had given to her small doses of iron, and, with the view of modifying and regulating the heart's action, tolerably large doses of digitalis were administered three times a day. The bowels, which were rather prone to be constipated, were kept regular with the aid of medicine. She was allowed a liberal diet, and, whenever the weather would admit of it, she took exercise in the open air.

During the time she was in the infirmary her general health improved considerably, but the prominent symptoms were but little if any relieved. She was made an out-patient on March 3rd, 1876, and is now attending occasionally at the infirmary; the last day on which she was seen was Sept. 5th, 1876. The thyroid was then considerably smaller, the heart-disturbance less distressing, but the eyes seemed even more prominent than they were, and to give some idea of the extent of the protrusion, I may mention that whilst in the waiting-room she happened to rub the upper eyelid of the left eye, which, by this movement, got so far behind the greatest diameter of the eyeball that some difficulty was experienced in replacing it. She says that the prominence of the eyes now varies considerably from time to time. She does not look nearly so anæmic, is much stouter and more healthy in appearance. Menstruation has recommenced.

**CASE 2.**—E. W—, a married lady, in comfortable circumstances, became an invalid about six years since, being then thirty-three years old.

*Family history.*—No peculiarity or particular hereditary taint of any kind; the family, a large one, generally healthy.

*Previous history.*—Previous to the commencement of her illness had always, from childhood, enjoyed excellent health, being almost too stout. Had a particularly clear and florid complexion; in fact, seemed the embodiment of a strong and vigorous constitution. The first appearance of her illness dates from the period already mentioned. She at this time had had six living children and five miscarriages. Just before she began to feel out of health, and for some time afterwards, she had cause for much anxiety. Her illness set in with a sense of great debility and also with great loss of flesh; almost simultaneously with the feeling of weakness she suffered from constant palpitations. Then the eyes became gradually more prominent, and her eyesight, which for two or three years previously had become defective (myopia), and required the use of spectacles, became much worse. No appreciable enlargement took place in the thyroid gland, but vascular pulsations were perceptible. The pulse-rate was quick, as much as 135 in the minute, and occasionally it was intermittent. Compared with the strength of the heart-beat, it was weak and small. The area of cardiac dulness was much increased, and a soft murmur accompanied the systole.

*Treatment.*—No medicine was ordered, but she was recommended to leave home and children for a while, and to seek perfect rest and quiet. This she did by going to Scotland for five weeks. During this time all her symptoms, saving and excepting the "proptosis oculi," gradually left her. Her strength and flesh returned, and subsequently she has borne two children.

*Present state.*—She now appears in every way

in good general health; her pulse-rate is normal, and so are the heart-sounds, but she says that now and then, even when quiet, her heart will beat rapidly, as if (to use her own word) she had been "startled." The eyes are now as prominent as they were when they reached their greatest point of prominence, and over the upper eyelid and eyebrow there is a peculiar blush of redness. No ophthalmoscopic examination has yet been made.

These cases are, I believe, fair examples of the disease, and they also display some of those differences as to the mode of attack, as well as the differences in the order in which these phenomena display themselves, which I have thought it necessary to notice. In one of my unrelated cases the three symptoms were occasionally, but especially at the monthly periods, subject to what may be called paroxysmal aggravations. The thyroid in this case was enormously large, and when the paroxysms referred to occurred, suffocation seemed sometimes to be imminent, but always subsided rapidly on an attack of epistaxis. Here the heart was unquestionably structurally affected. The other two cases got, I understand, perfectly well during a four months' residence in Switzerland.

Having related my cases, it may naturally be expected that I shall have something to say specially as to the treatment of this really extraordinary disease, but if I were prepared to offer any definite opinion or advice as to how such cases should be treated medically, I must, of course, base such opinion on a knowledge of the *cause* of the disorder. Here, then, occurs the very difficulty I mentioned in my preliminary remarks—a want of knowledge "*as to the effects of nerve-function, and correlation of each special nerve-function on the purposes of nutrition.*"

What is the cause of this disease? I am afraid that at present the only safe reply that can be given is an *echo*, "WHAT IS THE CAUSE OF THIS DISEASE?" Begbie thought that it depended partly on the condition of the blood and partly on the condition of the nervous system, but principally on the condition of the blood.\* My late friend Nunneley, of Leeds, thought it depended on an aneurismal state of the vessels within the cranium; and, when commenting on the frequency with which bronchocele exists in cases of protrusion of the eyes, he mentions his belief that the carotid should be tied, and says in six cases he performed the operation, and in five with a successful result.† Laycock considers the affection to be of cerebro-spinal origin.‡ Galezowski looks upon the condition as resulting from some lesion of the sympathetic, and mentions that Lancereaux and Peter found in one case hyperæmia and hypertrophy of the inferior cervical ganglion.§ Meyer believes that the sympathetic is affected, and gives four cases of this affection in females, and in all of them good results were obtained by *galvanising the sympathetic*.|| MM. Fournier and Ollivier describe the case of a woman who died whilst suffering from the disease, and the most carefully made autopsy failed to throw any light upon the cause of her malady. A most rigorous examination of the sympathetic was made, both with the naked eye and with the aid of the microscope, but

it appeared to be in all respects *perfectly healthy*.\* Trousseau sums up his opinion by saying he considers that exophthalmic goitre is the result of "a neurosis of the sympathetic."†

The weight of opinion, then, seems to lie in favor of the *cause* lying in some *pathological* condition of the sympathetic; but what the nature of—that is, the *precise* nature of—that pathological state may be, we have not, as yet, sufficient light to enable us to discern; it has, however, been made clear to demonstration that there need not be, of necessity, any absolute alteration of organic nerve structure for the development of the disorder, but, just as we are all aware that, through the aid of the sympathetic, and as the result of its *normal* function, local *natural congestions* may and do take place, so, *pathologically*, this system of nerves may effect congestions of an extraordinary and unnatural kind. From these considerations, I think some justification may be found for the belief that experimental research in the direction of the sympathetic, and the pathological influence exercised by it at times on the vaso-motor apparatus, would afford an ample reward to the industrious investigator by the discovery of the, at present, unknown cause of exophthalmic goitre.

During the time that B—— S—— (Case 1) was in the infirmary it so happened that I had the opportunity of showing the patient to Dr. B. W. Richardson, and he propounded a novel view as to the cause of exophthalmic goitre; but, as he informed me that he proposed putting this view before the profession ere very long, I cannot fairly do more than make this passing allusion to it.

Hitherto, then, the treatment of the disease has been very largely of an empirical character, and, as far as drugs are concerned, I think the general opinion of those who have had the management of such cases may be summed up as follows: Iron may be given, digitalis *should* be given, iodine *must not* be given.

With my own cases I have found that great quiet, freedom from excitement, a mild, plain, non-stimulating diet, attention to the digestive functions, and a residence in a pure and healthy atmosphere, have proved efficient auxiliaries (I dare not call them more) in promoting recovery; whilst I fancy—it may only be a fancy—that I have seen iron, but much more frequently digitalis, do some real service in modifying the heart symptoms, and, to this extent, contributing towards the cure.

## ON BURNS BY GUNPOWDER AND SCALDS BY STEAM.

By INSPECTOR-GENERAL SMART, C.B., R.N.

In a paper read before the British Medical Association meeting of South Hants, I related some observations on these points. Of the former category I dealt with twenty-one cases that occurred during our occupation of Canton in 1857, of which six proved fatal on the seventh, tenth, fifteen, seventeen, eighteenth, and thirtieth days respectively. I then detailed cases typical of the organic sequences

\* Edin. Med. Journal, Sept., 1863.

† Med. Chir. Transactions, vol. xlviii., p. 16.

‡ Edin. Med. Journal, vol. viii., p. 681.

§ Etude sur le Goitre Exophthalmique, Gaz. des Hop., 1871, p. 425.

|| Berl. Klin. Woch., 1872, p. 468.

\* Union Medicale, 1868.

† Trousseau's Clin. Medicine (Syd. Soc. Trans.), vol. i., p. 578.

that involved fatal results on the seventh day by meningitis, on the eighteenth by dysentery, on the thirtieth by exhaustion of nervous power with blood-poisoning, ending by ischuria, and one on the seventeenth by erysipelas attacking the head and face. I supplemented this by the details of a case that recovered, in which the primary violence was equally severe, but where these sequences were absent, and where constipation had been a characteristic of great prognostic value, as in all other favorable cases. The constitutional treatment was on the general principles observed in treating these complications when they present themselves idiopathically. The local treatment through all the cases was, in the first stage of depression and of inflammatory reaction, by carron oil on cotton wadding; in the second stage of suppurative action, attended by more or less sloughing, by oxide of zinc powder and by calamine ointment; and in the granulating and cicatrizing stages by the same applications as in the suppurative; but when the granulations became pale and flabby, by strips of lint covered with resinous ointment containing an excess of turpentine. It was gratifying to find in the end that over two-thirds of them—all very severe burns of the head and face, with more or less of both upper and lower extremities—recovered.

Then exemplifying the subject of scalds by steam, by those that lately happened in the *Thunderer* explosion, I stated that out of thirty-four vigorous men who were in the stokeholes, only two remain alive, and, in addition to these, eleven have since perished who were not so near to the exploded boiler. In all about eighty persons were involved, of whom forty-five have perished by an explosion of steam and hot water that burst the boiler with the force of a thirty-five ton gun, scattering huge masses of iron, tons of boiling water, and volumes of steam, together with dense fumes from the extinguished fires. After an hour the living, fifty-eight in number, followed by nineteen corpses, reached Haslar Hospital. Of the latter fifteen had been brought up dead from the stokehole, and four had expired in the passage to the shore. Of the living, the majority were very severely scalded, but only one had received mutilation—of an ankle-joint, dying in four hours. Within thirty hours eleven others had succumbed to primary shock. Some of them were semicomatose and little sensible to pain, others, after attempts to rally, became delirious, rolling heavily from side to side, and suffering from strangury, and stripping the dressings from their flayed limbs; breathing heavily, and vomiting. Those who survived the shock felt relief from scorching agony in thirty-six to forty-eight hours, gaining fitful sleep, passed excretions, and some asking for animal food. Possibly steam-scalding of fances and of primary air-tubes, in those who died of the so-called shock within thirty hours, was the lesion of most fatal import. The stage of reaction for suppurative effort was attended by internal congestions and inflammatory action in the brain and along the gastro-enteric track, with their characteristic symptoms. Under such conditions six perished on the fifth, sixth, eighth, and ninth days from injury. On the tenth day there remained alive forty-four, of whom twelve have died, twenty-seven have been discharged, and five remain under treatment (September 12th).

One of these last cases, J. D—, was severely scalded by steam over the head, face, and neck, in the air-passages, and over the arms and hands. He had been exposed to the first rush of steam up through the casing of the funnel, and 350 square inches of his surface had been denuded of its cuticle or covered with large vesications. On the sixth day all his unscalded surface was of a lurid red color. He then became delirious, and had frequent fits of moaning, which lasted till the eleventh day, when he again answered coherently; but from the fifteenth to the twentieth he was again delirious, yet after that he recollected for the first time that he had been on board the *Thunderer*. In the meantime he had severe ophthalmia that had ulcerated both corneas, the left irrecoverably. On the twenty-second day he complained of dysphagia, when the fauces were found sloughy and aphthous, and at the end of the fourth week gastro-enteritis afflicted him till the thirty-second day. On the fortieth day the kidneys were excreting bile pigment, sp. gr. 1.046, which state gave way to deposits of urates, phosphates, and, later, oxalates. He is now convalescent with, however, left staphyloma, and a few cicatricial contractions.

In another case that is recovering, the patient was scalded by steam to the extent of 400 square inches. He has had no signs of meningitis, but from the suppurative stage he has had attacks of gastric irritation, and that also of the kidneys, to the extent of excretion of albumen with broken blood-discs.

Such have been the two worst of the cases that have barely evaded the dangers which others have, only less in degree, gone through. In all, the results of nervous shock are well-marked in lowered courage and in dread of the past, from which time alone can restore them.

Sloughing of the deeper integuments has been rare compared with that in gunpowder burns, wherein delirium is of earlier access. On the other hand, early deaths from shock have been more frequent than in those burns, which may be attributed to the greater surface involved causing nervous depression, from which the reparative powers could not rally.

A scientific observer who had been witness of the results in two great magazine explosions remarked to me that 80 square inches of inflamed surface induced fever with danger to life. To test this assertion, I set a painstaking officer, Dr. Burke, to make approximate measurements of the scalded surfaces in twelve cases remaining in the seventh week. He found it, in square inches, to have been 198, 213, 282, 265, 283, 345, 355, 363, 377, 398, 477, and 766, giving an average of 356 square inches excoriated or vesicated. Of these the men now under treatment gave 198, 355, 363, 398, 477. All these had two points in common—the severity of the scald on the face and head, and sloughs, leaving indolent ulcers, on the arms, in which the new cuticle was very thin. The lowest, 198 square inches, was in the oldest man injured, aged fifty-three, who had a heavy struggle through the febrile reaction. The figures 355 belonged to the extremely dangerous case of J. D—, already detailed. The highest, 766 square inches, is altogether exceptional, as he could not have survived had the whole of that surface suppurated, much of it drying under the vesications. In him the scald was over nearly one-third of his

surface. He is one of the two remaining who were in the stokehole, and he escaped into a coal-bunker, from which he was drawn insensible.

The questions of viability as dependent on the extent of surface involved, which determines the degree of shock, and again on the depth of tissue injured as taxing the reparative powers, are worthy of more precise observation. Perhaps in those who did not survive primary shock, the scald of the respiratory track, as well as that of the skin, precluded rallying; while in those who fell later, the depth, more than superficial extent, proved fatal, which may explain also a higher mortality from the sequences in gunpowder explosions than in severe scalds not directly fatal. I would view 350 square inches, the mean of these measurements of scalds, and 250 square inches of surface burnt by gunpowder, as equally fatal injuries.

As to the treatment. Until decided signs of rallying, it was by stimulants, with sago and beef-tea, anodynes of opium and chloral hydrate, chloroform to allay irritation of the stomach, and the use of the catheter. After rallying, beef-tea and animal food, where appropriate, were given night and day. Lime-water with milk was given to allay irritability of the stomach. On and after the third day, laxatives were given when required to relieve constipation, which was a most auspicious sign throughout, as animal food was then well borne, and the healing process went on rapidly. In treating internal complications, general therapeutics were observed. In those of the air-passages there were favorable results in the congestive stage, and pneumonia developed only in two cases, both fatal. The meningitic symptoms were beyond special treatment, and yet two such recovered, and several also in which delirium had been present. Gastro-enteritic symptoms ran high, but subsided more readily than the meningitic with the establishment of suppuration, but there were instances of recurrence at a later stage, in which one died with coffee-ground vomit. The renal disturbance was generally checked by alkalies and nitric ether. Great nervous prostration caused anxiety as leading to syncope, which was the mode of death in more than one instance in the suppurative stage.

The local treatment was by oil and lime-water on cotton-wadding on every part to the fourth and fifth days, and later, in the majority, on the limbs. This being found inconvenient on the face, head, and neck, it was changed for a wash over with carbolic oil (1 to 10), then dusting on it from a common flour-dredger a powder, consisting of one of oxide of zinc, one of magnesia, and two of powdered starch, sifted on wherever moisture appeared, care being taken to keep free the facial orifices. It formed a mask to the features, excluding the atmosphere. Under its protection the process of "scabbing" went on favorably, and, the crusts detaching, the scalds were found healed, except sometimes on the pinna of the ear, where abscesses gave trouble. In one case only is there any permanent deformity by cicatrices on the face, so that I think it applicable also in confluent small-pox. It was used also on some sores on the limbs, the forearms, and hands with success. Although only a mode of excluding atmospheric air, yet its claim is for simplicity and readiness of application. The treatment by oil and lime-water was in general disused before the tenth day; and when the above was not employed, it was sub-

stituted by a liniment of carbolic acid and olive oil (1 to 20) on lint under oil-silk, retained by bands of Lister's gauze, which, although locally successful, was not found free from a suspicion of irritating the kidneys.

To maintain the highest possible degree of atmospheric purity, almost every known deodorant was used; but preference was given to the process of Dr. Gooldeen, of disengaging chlorine, insensibly, from a mixture of nitrate of lead and common salt in solution, sprinkled on the floors from watering-pots, and on sheets hung round the offensive beds.

Very much has been due to the efforts by careful personal attention of the surgical staff, under the guidance and responsibility of Deputy Inspector-General Loney; for by them the duties, however humble, have been performed in a zealous spirit, regarding solely the welfare of the sufferers.

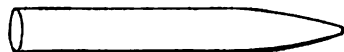
## FOREIGN BODIES IN THE AIR-PASSAGES.

### TWO CASES.

By ROBERT J. SPITTA, M.D. Lond.

THESE cases will derive an additional interest by contrasting them at the outset. One was from a piece of slate pencil of the size and shape represented in Fig. 1, which became immovably im-

Fig. 1.



packed in a large bronchus; the other resulted from a button-screw, as shown in Fig. 2, which

Fig. 2.



was ejected, with complete recovery. Tracheotomy was performed in the latter case only.

CASE 1.—Mrs. M——'s child, aged one year and ten months: Nov. 28th to Dec. 6th, 1862, inclusive. In this case there was considerable but not very violent choking during the passage of the foreign body through the larynx and trachea, but comparatively little cough or dyspnoea afterwards. It took a course, point downwards, to the left bronchus, in which it impacted itself so firmly as to plug that tube completely. This caused pneumonia, of which the patient died on the eighth day after the accident. At a post-mortem examination I removed the pencil from a large bronchus, and exhibited it at the coroner's inquest.

CASE 2.—Mrs. H——'s child, aged two years and a half. This second case is of far greater surgical interest, being, as respects its favorable termination, unique. On Jan. 17th, 1876, at 5 P.M., I was summoned to see the child, who was reported to be "choking from having swallowed a nail." I arrived within twenty minutes after the accident; but as I entered the house the child was relieved. Mrs. H—— stated that ill

the very moment before I knocked he was suffocating from a button-screw, similar to that represented. From this account it seemed more than probable that a foreign body had passed into the larynx; but, finding the patient so perfectly comfortable, I indulged the hope that it had been jerked into the pharynx during the choking fit from which he had just recovered, and that he had then really swallowed it. With this hope I ordered a dose of castor oil, and desired a strict search to be made into every evacuation, received in water.

Jan. 18th.—A restless night, but the child had neither dyspnoea nor cough, and was running up and down stairs without any distress whatever. The oil had acted, but no screw.

19th.—Ominous large moist bronchial sounds were now heard on both sides; but notwithstanding these, there being neither cough nor dyspnoea, I still clung to my former hope that the screw had been dislodged. On the following day, however, the third after the accident, the typical symptoms of the case commenced, the first attempt being then made to eject the foreign body.

20th.—Much uneasiness and cough during the morning, but at 3 P.M. such a violent attack of dyspnoea and cough occurred as to induce Mrs. H— to send for immediate help, thinking that the child was actually choking. My son, Mr. Edmund Spitta, late Demonstrator of Anatomy at St. George's Hospital, was promptly in attendance, and the attack passed off in about twenty minutes; but from his account of the severity of the seizure, I thought it desirable to have a consultation as to future treatment. This was held at 7 P.M., and both he and my other partner, Dr. Locke, came to the same conclusion as myself, that the screw was lodged in some large bronchus of the right side; and we decided that whilst the respiration was quiet we ought to operate, in the hope either of extracting it at once, or at all events of providing another opening for the transit of air in case of any reflex closure of the glottis. Accordingly, at half-past seven, tracheotomy was performed by my son, assisted by myself, Dr. Locke kindly presiding over the chloroform. After the operation, which offered no special difficulty, the child was everted and shaken rather roughly to dislodge the screw, but without effect. We then tried to reach it by means of a probe carefully introduced, but also ineffectually, although the trachea had been opened as low as possible. The tube was then adjusted, and the little fellow put to bed in a warm room in comparative comfort, and wearing, as we all thought, a less anxious countenance, and a less dusky appearance of imperfectly aerated blood, than before the operation.

21st.—My son watched the case during the night, when all progressed favorably, and the next day (22nd), the voice having returned, the breathing being easy, but there being unnecessary irritation from the instrument, he took out the tube without closing the aperture.

23rd.—At 8 P.M. I had the pleasure of meeting Mr. Bond, of Westminster Hospital, who was requested to see the case. He cordially concurred both in the diagnosis and treatment. The prognosis, however, we thought gloomy. The ejection of the screw seemed improbable, and its becoming encapsuled was suggested as the only favorable result attainable. Nature, however, took a more

sanguine view of the case, and conducted it to its termination with complete success. She first embedded the screw, and then having surrounded it with mucus so as literally to convert it into one large slippery pellet, quietly landed it in the child's mouth, to the astonishment and admiration of all. But I anticipate.

24th to 28th.—During these next five days, the little sufferer seemed at his worst. The discharge through the wound was profuse and most offensive. The pulse was hardly able to be counted, and the respirations above 60. His face was flushed with hectic, his appetite failed, his prostration became excessive, and every night brought its fearful attack of coughing and dyspnoea, lasting about half an hour. The chest presented large moist bronchial sounds everywhere, interspersed with occasional wheezings on the right side, and both Dr. Locke and my son observed at their separate visits that the breathing was always supplemental on the left side. We all thought badly of the child during these five days; but, in reality, nature was prosecuting a cure by ulcerating a bed for the screw, with a view to its future expulsion.

29th.—This morning, at 2 A.M., the worst seizure of all occurred. It was so violent as to induce Mrs. H— again to send; in expectation, a second time, that the child would be choked before we arrived. My son attended, and the attack subsided, but not until it had excited vomiting, and caused a discharge of the contents of the bowels. But from this moment the case took its favorable turn. The pulse became natural, and the breathing easy. The moist bronchial sounds were less extensively heard, and the fits of coughing became diminished both in number and severity. The wound granulated itself together daily till, on February 11th, exactly three weeks after the operation, it was perfectly closed. The appetite returned in vigor, and the little fellow was cheerful and playful, and altogether seemed quite convalescent.

Two more reports will complete the case.

Feb. 17th.—Coarse, sonorous rhonchi were noticed on the right side, so loud as to be heard on the left. But the child showed no discomfort, and he was allowed to be about as if in health.

19th.—On this memorable morning, one month and two days from the accident, after moderate coughing, the screw was lodged in the child's mouth, and Mrs. H— received it into her hand, but so enveloped in mucus as to be unrecognisable. Two hours afterwards we heard the respiratory murmur, which had been completely overpowered during the whole illness, quite normal, and nearly equal on both sides.

In closing these cases the only remarks necessary to make are in reference to tracheotomy. Was the operation advisable, seeing that we were unsuccessful in extracting the screw? To this question I answer without hesitation that it was not only advisable, but peremptorily called for, and of the greatest service. In the first place we might have reached the screw, and have put an end to the case at once. But independent of this too fortunate alternative, the operation still fulfilled its three following most important objects. It secured the transit of air during the child's attacks; it provided an easy exit to the putrid exhalations of ulceration; and, lastly, it gave the strongest sense of satisfaction to the parents as

well as to ourselves, that, supposing the case had terminated unfavorably, nothing had been left untried.

Clapham-common, S.W.

## THE LOCAL TREATMENT OF PSORIASIS.

By WYNDHAM COTTLE, M.A. Oxon., F.R.C.S.  
Eng.

Senior Assistant-Surgeon to the Hospital for Diseases of the Skin,  
Blackfriars.

THERE are a class of cases of psoriasis, namely those not uncommon examples where there is an excessive formation of dry scales, in many instances even producing the thick crusts with which observers of this complaint are familiar, and forming in chronic and neglected cases as long as they remain an insuperable obstacle to recovery. This condition is very common in congenital and inveterate cases, and when in the neighborhood of the joints these crusts form hard shells, they preclude movement, or at least restrict it, and render it painful. It is to such cases as these that I have found the treatment I am about to suggest applicable. The consideration that a material improvement in the condition of parts might be expected to follow the hindrance of evaporation locally, led me to endeavor to procure such a result. After various trials I have found the subjoined method most advantageous.

All crusts and scales having been removed as far as possible, and the absence of grease being ensured by wiping the parts with ether or rectified spirit, and the skin thoroughly dried, the solution of india-rubber is thickly applied with a brush over the affected places, and this application renewed as often as is needful for the formation and maintenance of a continuous covering of india-rubber over the affected skin. The chief difficulty I encountered lay in procuring complete adhesion of this covering, and in this respect I found india-rubber much superior to gutta-percha or collodion flexible, &c. A very good solution has been supplied to the hospital by Messrs. Allen and Hanbury, of Plough-court, and which answers very fairly when carefully applied. Its composition is, india-rubber half an ounce, chloroform eleven ounces and a half. Solutions in ether were not found so suitable as those in chloroform, for, from their more speedy solidification by evaporation, some difficulty was experienced in their use, especially in the hands of patients.

I would claim for this mode of treatment that, in the majority of the class of cases mentioned, the recovery has been more rapid than with the ordinary local measures, and also very comfortable to the patient, free from the objectionable odor of the tar compounds; that its action is confined to the affected parts themselves, requiring no confinement of the patient, nor indeed causing any inconvenience to him; a further recommendation being its ease of application. At the same time I would guard against its being understood that I find this a local method of treatment to be indiscriminately used in this often somewhat intractable complaint, for the pathological conditions that call for the employment of some such remedy do not present themselves in the majority of cases; still I think

it may be found a useful adjunct to the recognised treatment, and in a large percentage of appropriate instances give very good results. The mode of action of these coverings, that are impervious to moisture, seems to be that they prevent evaporation, and hinder the loss of the natural perspiration of the part. The result with which perhaps we are more concerned is that the affected skin, previously dry and harsh, and with its natural elasticity diminished, becomes supple, and almost moist, while the scales and crusts show little or no tendency to reform, any that may have been reproduced coming off with the india-rubber, leaving the skin almost normal beneath. After a time the deep red color of the patches fades, there remaining eventually little more than the staining of the skin that always persists for some time.

This mode of treatment of course is not suited to cases in an acute stage, or in which excessive action is present. I have employed it in upwards of fifty cases, chiefly at the hospital, the details of which would occupy too great a space. I will, however, quote one typical instance.

A young woman, nineteen years of age, was admitted to the hospital on March 8th. She was of strumous appearance, but otherwise in fair health. Her affection had existed from childhood with varying degrees of intensity, sometimes leaving her almost free, but with ever-recurring exacerbations. On admission her condition was as follows. Irregular patches, averaging about an inch and a half in diameter, were scattered over the body, and more thickly on the outer aspect of the limbs, and especially about the elbows and knees, extending over the wrists and hands. These patches had a base of inflamed and thickened cutis, overlying and firmly adherent to which were hard and dry crusts, the results of hyperplastic action of the cuticular elements of the usual psoriasis type, in places exceeding the eighth of an inch in thickness, most abundantly developed around the elbows and knees. These crusts having been removed, to one side of the body and corresponding limbs the india-rubber solution was applied, while, to gain a comparative result, the other side was treated with mercurial and tar compounds. The affected places on the side to which the india-rubber solution was used at the end of three weeks became mere red markings, having lost in great measure their thickened bases, with but little tendency to the formation of scales remaining, while on the opposite side they continued to be produced, though with lessened activity, the inflammatory condition persisting. The india-rubber solution was then applied to the whole of the patches. She was discharged on May 8th with only red stains to mark the former sites of the disease. The usual constitutional treatment was pursued.

In many of my other cases also one side or limb has in like manner been treated with these impermeable coverings, the corresponding parts receiving the more ordinary applications to allow of comparison of their actions.

The same local treatment is applicable also to some conditions of chronic eczema, but I have not as yet brought my experiments in that direction to a conclusion.

Savile-row, W.

## A CASE OF URTICARIA BULLOSA.

By DYCE DUCKWORTH, M.D., F.R.C.P.,

Assistant-Physician to St. Bartholomew's Hospital; Examiner in Practice of Physic in the University of Edinburgh.

THE following case presented features of interest sufficient to warrant its publication, and the particulars of it are as follows:—

On July 18th E. H—, aged thirty-three, the wife of an artisan, and mother of six children, came as an out-patient to the hospital. She was a dark-haired, fresh-complexioned woman, of slender build, and had always enjoyed good health.

On the 11th inst. she went with her husband and baby to Sheerness for a week's holiday. She stated that on the 12th her face became puffed over the right cheek, and an itching lump formed there. On the 13th lumps appeared on her right arm, and next day on the left arm. These were red in color, and itched. On the 15th "heads" were seen upon these lumps. She could not in any way account for the disorder. The weather was very hot, but her arms were not exposed to the sun, and she did not bathe in the sea. On the 17th the family returned to London.

The following day there were to be seen four distinct bullæ about the right olecranon, some having burst and given exit to a clear gummy serum. There was one wheal, not vesicular, situated also near the olecranon. Over the right wrist a large wheal, the size of half a walnut, was found, which was red and itched, and on the flexor surface of the wrist over the ulnar half there was another less raised but pomphous patch. On the left arm were four bullæ, the size of marbles, about the elbow, and others three or four inches below that point, all having burst from injury. Some small red pomphous patches were also seen above the elbow. There was some puffiness on the back of the left hand. The face and hands were sunburnt, but not the arms. No bullæ or wheals were found in any other part. The tongue was flabby and thinly furred, appetite not good, bowels open daily. The patient complained of a fluttering sensation at the precordia, and had done so for a week previously. Cardiac sounds natural. Catamenia regular. The urine had been thick of late. She drank usually a pint of beer daily, and had some gin in addition during her holiday.

On inquiry I discovered that on the 12th inst. the patient and her husband ate a tinful of American preserved lobster, and the baby likewise partook of this delicacy. Neither husband nor infant, however, had any untoward symptoms.

The cause and the nature of the disorder were thus made quite plain. I could have no doubt that the case was one of bullous urticaria. The first impression that naturally occurred was that the patient was suffering from pemphigus, but careful examination showed that neither on etiological nor on pathological grounds could it be thus regarded.

Bullous urticaria is described in books on cutaneous medicine, but I imagine that it is a very rare disorder; indeed I do not remember to have seen a single instance of it during my four years' term of service in the skin department of the hospital.

In the presence of all the symptoms, and notwithstanding the long period that had elapsed since the disturbing element of diet was introduced, I

prescribed half a drachm of powdered ipecacuanha as an emetic. Mr. Wood, the late apothecary to the hospital, used to treat all cases of severe urticaria in this way, and with good results. Five grains of calomel-and-colocynth pill were ordered over night, and a draught with bicarbonate of soda and diluted hydrocyanic acid out of infusion of calumba was prescribed thrice daily. Each bulla and patch was painted thickly with flexile colloidion, the larger ones being evacuated in the first instance by my colleague, Mr. Langton. Unfortunately the patient never returned to enable me to record the further progress of the case.

It is, perhaps, remarkable that a vesicular stage is not more frequently reached in severe cases of urticaria. In this particular instance I can offer no explanation of its occurrence. It did not appear that the patient was liable to attacks of nettle-rash. That there was nothing especially virulent in the lobster she ate is proved by the absence of any symptoms in her husband and infant, who also partook of it. But in her case, the ordinary effusive state constituting a wheal was so far surpassed that free vesiculation took place. The serum which was let out from the entire vesicles was quite clear, and in no degree puriform in appearance. It is noteworthy that the affection was tolerably symmetrical, and, with the exception of the right cheek, was confined to the upper extremities. The suffering during the week had evidently been very considerable, and of a much more severe character than is common even in smart cases of urticaria.

Grafton-street, W.

## A SIMPLE MODE OF FEEDING SOME PATIENTS BY THE NOSE.

By CLEMENT DUKES, M.B., B.S. Lond., M.R.C.P. Lond.,

Medical Officer to Rugby School.

I FIRST had to resort to some means for feeding a little child during the time I was resident medical officer at the Hospital for Sick Children, Great Ormond-street, in a case of phagedenic ulceration of the soft palate after scarlatina, under the care of Dr. West, the pain being so acute when any nourishment or medicine was put in the mouth that the child would take nothing; but by the process I am about to describe I was enabled to feed this child regularly, without terrifying or hurting it. Also, for a case of collapse in pneumonia in a child, when the patient was past swallowing naturally, I was able to revive him again for a time, and cause hope that he might have rallied permanently. By its means we obviate the use of *instruments* for feeding by the nose; also the use of injections per rectum in many cases; and in cases of poisoning we can pass what fluids we wish into the stomach when the stomach-pump is not within reach, or is unsuitable, and the patient cannot or will not swallow naturally.

The kind of cases where the process will prove of greatest service are mania, delirium tremens, diphtheria, croup, stomatitis, cancrum oris, &c., and for fasting girls and spoilt children, who, when ill, refuse food.



The *advantages* are—(1) simplicity; (2) freedom from danger, or risk of accident; (3) imitation of the natural process of deglutition.

The *apparatus* is—(1) a yard of india-rubber tubing of one-eighth of an inch bore; (2) a bottle of any kind (an ordinary soda-water bottle does well); (3) a piece of twine to tie the tube in the bottle, so that the end of the tube reaches almost to the bottom of the bottle.

The *nutriment* (or *antidote* if required) should be warmed as a rule, and put in the bottle, about half a pint in quantity, and may be composed of milk, or eggs and milk, beef-tea, stimulants, medicine, &c., as desired.

Its *mode of action*, represented in the accompanying outline, is that of a syphon. 1. The

water, black wash, or solution of perchloride of iron, &c., enters the one nostril and passes by the posterior nares into the other nostril, in a continuous gentle stream, without any of it falling into the pharynx, provided the head be inclined well forwards; the nostrils are thus well washed out, or in the case of epistaxis, an astringent being used, are plugged.

Rugby.

## ON THE USE OF THE ASPIRATOR.

By J. E. M. FINCH, M.A., M.B.,

Medical Superintendent, Leicester Borough Asylum.

I AM desirous of giving publicity to the following case, as illustrative of the valuable aid of the aspirator in the treatment of disease.

Miss M. O—, aged forty-two, the chief nurse of this asylum, was, on Wednesday, April 19th, suddenly seized with intense pain in the abdomen, followed by vomiting. The patient had for some months suffered from indigestion, attended by constipation, but was about her ordinary duties up to the time of the attack. The pain was so agonising that, though by no means of an hysterical temperament, she could not refrain from screaming. She says it commenced on either side of the umbilicus, and seemed as if her inside was being drawn out. This was followed in a few minutes by a feeling of something giving way in her inside, and then the pain became easier. After about a quarter of an hour, while being assisted to bed, the pain returned as severely as before. On my seeing her shortly after she was lying upon her back with her knees drawn up, and vomiting frequently. Her countenance was extremely anxious, and her skin cold and clammy. The pain had abated, but there was great tenderness of the abdomen, with tympanites. The bowels had acted slightly a few hours before the attack. Her pulse was 120, small, feeble, and irregular. The patient appeared to be in a state of collapse, and said she thought she was dying. I prescribed warm linseed and mustard poultices over the abdomen, ten-minim doses of solution of hydrochlorate of morphia, and small quantities of iced brandy-and-water.

April 20th.—The objective symptoms remained unaltered, but she expressed herself as feeling somewhat better. The same treatment was continued.

21st.—Passed a restless night, and the symptoms were not so favorable, the abdomen being much more tense. A soap-and-water injection was given in the morning, and again in the afternoon, but did not afford any relief on either occasion. She was then ordered small injections of beef-tea, with chloric ether and opium every three hours, and the abdomen was rubbed with camphor liniment, chloroform, and opium.

22nd.—The patient passed another restless night, and had frequent attacks of severe vomiting. The abdomen was now so distended as to seriously impede the heart's action. The pulse was 130, small, feeble, and very irregular. At the suggestion of Dr. Pearce, of Leicester, who was attending the case in consultation with me, it was decided to use

bottle with the fluid in it is held or fastened above the head of the bed; the patient lying on his back without a pillow. 2. The tube is exhausted of air by laying hold of the tube close to the mouth of the bottle with the finger and thumb of the left hand, and running the finger and thumb of the right hand along it, closely compressing it while doing so; the fluid of course following the motion of the hand, when the pressure of the left hand is removed. 3. The free end of the tube is then passed *just within* the nostril, and retained there with the left hand, while the right has the tube closed by the pressure of the finger and thumb. 4. By alternate compression and relaxation of the tube an ordinary mouthful of fluid can be allowed to escape at a time, permitting each quantity, if desired, to pass into the stomach before another gulp is liberated.

I have also found this a very convenient apparatus for washing out the nasal cavities, as, for example, in chronic catarrh, fetid secretions, ozæna, syphilitic ulcers, certain cases of diphtheria, epistaxis, and when foreign bodies have been retained in the nostril. The tube is inserted in one nostril, as above, and held by the patient; the head is now inclined *forwards* over a basin; the fluid, which may be either water, carbolic

the aspirator. Accordingly, the smallest needle belonging to it was inserted half-way between the pubes and umbilicus, and a large quantity of flatus withdrawn. This was immediately followed by great relief of the tension, and the pulse dropped during the operation to 120, and became more regular. The patient expressed herself as feeling much easier.

23rd.—The abdomen had again become swollen, but not to so great an extent. Pulse 130, irregular. In the afternoon the bowels acted copiously, for the first time since the commencement of the attack.

24th.—The symptoms were much more unfavorable to day, and the vomiting and retching most distressing. Towards evening the patient appeared to be in a moribund state. As a last resource it was resolved to again use the aspirator, and this time the needle was inserted into the cæcum. A large quantity of gas was withdrawn, together with a little feculent fluid. The relief on this occasion was not so immediate, but the patient passed a better night, and on the following morning (Tuesday) had another action of the bowels.

After this the tension of the abdomen began to decrease, and there was no need to use the aspirator again. I do not, therefore, think it necessary to give any further details beyond mentioning that the temperature, which was carefully taken night and morning, never exceeded 101·8°.

During the next two months the patient very slowly improved, and about the middle of June was well enough to go to Scarborough for change of air.

In two particulars I think the above case affords weighty evidence in favor of the use of the aspirator. In the first place, it unquestionably relieved the tension of the abdomen, and thereby enabled the bowels to act; and, secondly, its use was not followed by any inflammatory action.

Humberstone, near Leicester.

## EUCALYPTUS GLOBULUS AS A CURE FOR AGUE.

By JOHN GURNOW, M.D. Lond.,

Professor of Anatomy in King's College, Assistant-Physician to King's College Hospital.

WHILST there is an almost complete unanimity as to the advantageous effect of the cultivation of the eucalyptus tree in the removal of malarial fevers from marshy districts, foreign observers differ greatly in their estimate of the value of its preparations in the treatment of these diseases, and very few, if any, trials have as yet been made of them in this country. The experiments of Fichter at Basle, and of Hertz at Copenhagen, gave almost negative results; whilst those of Groos in Hungary were extremely favorable. Further investigations are required to clear up these discrepancies, which are doubtless due to the difference of the preparations made use of, and the varying doses in which the drug was exhibited, as well as to the length of time that the disease had existed, and perhaps also to the place of growth of the trees from which the preparations had been made. Hertz thinks that old cases will yield better results than new ones,

but that recent ones are sometimes very speedily cured by this drug is sufficiently evident from the notes of the two cases which are appended. The cases came under my care whilst I undertook the temporary charge of the patients at the Seamen's Hospital for my friend Dr. Harry Leach. The results are the more important because when I prescribed the eucalyptus I was very sceptical as to its value; for, with the exception of the chin-chona alkaloids and arsenic, I had always before observed a signal failure of the numerous alleged remedies for intermittents. Amongst these were the sulphites of magnesia and soda, salicin, sulphate of beheria, picrate of potash, &c., and they had all been administered most freely. Moreover, both patients were under observation for some days before the medicine was exhibited, in order that the severity of the cases might be properly estimated, and that no fallacy might arise from the spontaneous subsidence of the disease, as occasionally occurs from a change of residence. The preparation of eucalyptus that I used was the tincture made by Messrs. Savory and Moore, and, except an agreeable feeling of warmth in the mouth and pharynx, no appreciable effects but the rapid cure of the fever were noticed.

I had hoped to have made a more extended trial of the drug before publishing these cases; but ague is so very seldom seen in London that it may be a considerable period before I have another opportunity, and wider and more exact experiences can be so readily obtained in districts where malarial affections are endemic that I have thought it better to record them at once.

CASE 1.—S. S.—, aged eighteen, a Norwegian, was admitted May 23rd, 1876. He had been suffering from intermittent fever for four or five weeks. The attacks were moderately severe and of a well-marked tertian type. An expectant plan of treatment was pursued until June 9th, and during this period the paroxysms recurred on alternate days with the utmost regularity. They began at 10 A.M., reached their acme between 1.30 and 8 P.M., and passed off about 6 P.M.; thus lasting about eight hours. The highest temperatures varied from 104·8° to 105·6°. On June 9th the tincture of the eucalyptus globulus was given in one-drachm doses three times daily. The next day, on which another attack was due, his temperature only rose to 100°, and on the 12th to 100·4°; and after this date no further paroxysm occurred during the remainder of his stay in the hospital. On physical examination, a systolic bruit was heard over the apex of the heart, but this was evidently of some standing, and had so far given rise to no symptoms. The splenic dulness was normal.

CASE 2.—C. O.—, aged forty, a Dane, was admitted on June 19th, 1876. The attack commenced on June 14th, and was of the ordinary tertian type. The paroxysms were very severe, and extended over nearly twelve hours on an average. On June 27th the temperature was carefully taken at short intervals by Mr. Lacy, the house-physician. At 10.30 A.M. it was normal, at 11.30 it had risen slightly, and soon after rigors set in; at 12.40 P.M. it was 101·6°, at 2.20 P.M. 105·6°, at 2.40 P.M. it had reached its highest point, 106·4°, at 3 P.M. it had fallen to 105·4°, at 6 P.M. to 101·4°, at 9 P.M. to 100°, and at midnight it was still above normal at 99·2°. The fit on the 29th was quite as severe. On July 1st,

just before the next attack was due, the expectant plan of treatment which had hitherto been pursued was given up, and the tincture of the eucalyptus exhibited in drachm doses three times a day. The next two paroxysms were much shortened in length, and the temperature did not rise quite so high. On the 5th the dose was increased to two drachms three times daily, and he had his last attack on the next day. He was kept under observation until July 15th, and continued taking the medicine up to that date. This patient's splenic dulness was increased in extent, and the edge could just be felt. He had suffered from an attack of ague nine years before.

Warwick-street.

### CASE OF HYPERTROPHY OF THE SPLEEN; DISORDER OF THE RESPIRATORY AND DIGESTIVE ORGANS; SPLENOTOMY; RECOVERY.

By M. J. PEAN,

Surgeon to the St. Louis Hospital, Paris.

(From Notes translated by WILLIAM E. ROWLATT.)

THIS case of splenotomy performed by M. Péan brings the total number of operations of this kind upon record up to six. Of this number two only have been performed by M. Péan, the first in 1867, the second is the case that forms the subject of the present communication. The four remaining observations, we believe, are due to MM. Kùchler, Spencer Wells, and Kœberlé; but, strange to say, all have been unsuccessful except the two due to the Parisian surgeon.

Mrs. D—, twenty-four years old, well-developed, has no trace of hereditary disease or of syphilis; married at seventeen, before she menstruated. Had been confined four times: twice at nine months, both children dying shortly after birth; once at seven months, the child dying; and lastly, a miscarriage at four months. Had only seen catamenia eight times in seven years. She first became aware of the existence of her tumour eighteen months before the operation, and since that time it had developed itself with great rapidity. At this period her appetite diminished considerably, and she frequently vomited after some slight exertion. She was also troubled with a slight cough. In the month of February the tumour occupied nearly the whole of the abdominal cavity. It was hard and movable to the touch, and sprang from the left hypochondrium and descended to the pelvic cavity. No ascites.

In the month of April, at the time of the operation, the tumour had considerably augmented in size. The abdominal walls were greatly distended, but were still movable over the tumour, and were not the seat of any vascularisation. The surface of the tumour did not present any depressions, and was uniformly smooth. It was somewhat elliptical in shape.

*Operation* (April 25th).—An incision was made from eight centimetres above the navel to within six centimetres of the pubes. The peritoneum was then incised, and the tumour exposed. The intestines and epiploon, drawn to the right of the tumour, were maintained in the abdominal cavity

by means of heated compresses. The tumour was then drawn gradually through the wound, and a ligature was placed round the hilum, which contained some very large vessels, especially a splenic vein of the size of the index finger. This being done the tumour was excised above the ligature. Nearly a litre of blood flowed from the spleen after the section, otherwise the loss of blood was insignificant, and may be estimated at about thirty grammes. The pedicle was brought to the superior extremity of the wound, which was then closed by a simple suture.

April 26th.—General condition satisfactory. Pulse 85; temperature 37·7° C. Has no pain. Urine red, owing to the presence of some red globules.

27th.—Temperature a little above normal. Urine less red. Strips of gauze saturated with collodion placed on the wound.

May 2nd.—Pedicle came away. The last points of the suture were taken away. A small abscess has formed where one of the sutures was placed, and has been incised. Patient very cheerful; appetite excellent.

18th.—Patient up for the first time. Sleeps and eats well. Wound very nearly healed.

22nd.—Quite well, and allowed to return to her home.

Since this last date the patient has continued to do well, and has not had any bad symptom; and she is now (August 25th) able to continue her occupation.

The tumour, emptied of blood, weighed 1125 grammes. Its longitudinal diameter was 0·22m.; transverse diameter 0·12m.; thickness 0·08m. It was nearly of the consistency of the liver, and was difficult to tear. The hypertrophy was found to be parenchymatous.

### A SUCCESSFUL CASE OF TRANSFUSION.

By VICTOR A. WARTENBERG,

Senior House-Surgeon, Manchester Royal Infirmary.

INASMUCH as cases which are so desperate as to call for transfusion as a last resource are so rarely successful, I wish to record one that has lately occurred at this hospital.

On the 22nd day of July last Mr. Hardie, one of the assistant-surgeons, in the absence of Mr. Bowring, amputated through the middle third of the thigh, in a youth aged twenty-two, for old-standing strumous disease of the knee-joint. The operation he performed was one he describes as an "oblique circular," or a circular operation with the anterior portion of the integument cut longer than the posterior, so that, when healed, the cicatrix is at the back part of the stump, and not directly over the end of the bone. The vessels were secured mostly by catgut ligatures, but the supply of these having failed a few hempen ligatures were used. The patient progressed favorably until the separation of the last hempen ligature, when secondary hæmorrhage set in. This was checked by elevation of the limb and by the application of cold. Three days afterwards hæmorrhage, much more profuse, supervened, and this, too, was arrested after some difficulty by the injec-

tion into the wound of the muriated tincture of iron. The next morning, however, about 11 o'clock, I was summoned in haste, and found the patient bleeding profusely from the unhealed portion of the stump. A tourniquet was applied as quickly as possible, and an attempt was made to find the bleeding vessel, but at that time the youth was pulseless, perfectly blanched, and the heart's action was almost imperceptible. I gave him as much brandy as I could get into him, applied hot bottles and blankets, and sent for Mr. Hardie, who kindly came at once, and found the patient in the condition I have just described.

Mr. Hardie determined to try transfusion, but with a very faint prospect of success. While preparations were being made for the operation he opened up the stump, and passed a needle carrying a wire through the skin, and underneath some tissue which appeared to contain the bleeding vessel, bringing it out again at the same opening in the skin. The wire was then twisted over a pad of lint, and pressure thus made on the vessel. One of the resident pupils of the infirmary, Mr. H. Irvin, very generously volunteered to supply the blood. It was intended to practise immediate transfusion by means of Dr. Aveling's instrument, but its action not being satisfactory it was discarded. A pint of blood was collected and defibrinated by passing it twice through a fold of muslin. The total quantity was thus diminished by about four fluid ounces. The remaining fluid portion was then slowly injected by means of an extemporised apparatus into the largest visible vein in the patient's arm. It was observed that the blood would not flow freely into the vein until the latter was tied round the cannula with a fine ligature. Precautions were taken throughout the proceedings to maintain the blood at its normal temperature by immersing the vessels containing it in boiling water.

Immediately the operation was concluded, the pulse became a little stronger, but the patient did not entirely recover from the state of collapse for nearly a couple of hours, when he recognised those about him, and was able to speak to them.

The next morning his temperature rose to 102.4°, but fell again towards evening, and after that he made a good recovery without a single bad symptom.

The wire which was used to compress the bleeding vessel was untwisted thirty-six hours after its application, and withdrawn at the end of a week.

The patient was transferred to the Convalescent Hospital at Cheadle on the twenty-fourth day after the transfusion.

A SINGULAR instance of the abuse of opium is detailed in a recent report of cases in the Bellevue Hospital, New York. The patient, a man formerly employed in the hospital, began the use of morphia subcutaneously, for the relief of pain, and continued it for two years. He employed Magendie's solution, and had increased the quantity until finally he was taking 300 minims every twenty-four hours, the largest number of injections in the time being twelve. The appearance of the man's body and thighs was striking, for they were studded with discolored spots, cicatrices from old punctures and localised abscesses, some of which were surrounded with erysipelatosus inflammation. The posterior aspect of the trunk was nearly as bad; for, failing to find sufficient uninvaded territory upon the anterior portion, he had learned to thrust the needle of the syringe into his back. At the latest date, the patient was suffering severely from the discontinuance of the opium, which the doctors had cut off entirely.

## A Mirror OF HOSPITAL PRACTICE, BRITISH AND FOREIGN.

Nulla autem est alia pro certo noscendi via, nisi quamplurimas  
et morborum et dissectionum historias, tum aliorum, tum proprias  
collectas habere, et inter se comparare.—MORGAGNI *De Sed. et  
Caus. Morb.*, lib. iv. Proœmium.

### GREAT NORTHERN HOSPITAL.

#### RUPTURE OF POPLITEAL ARTERY.

(Under the care of Mr. W. HARRISON CRIPPS.)

At 2 P.M. on June 19th, W. W.—, aged twenty-one, was walking down-hill by the side of a heavy waggon, one wheel of which was locked. He fell down with the lower part of the right thigh under the fastened wheel. In this position he was dragged a short distance, but the wheel did not pass over the limb. When admitted into hospital, half an hour later, he was in a state of collapse, with a cold moist skin and feeble pulse. From this condition he soon rallied.

On examination of the injured limb there was a small superficial wound over the patella. The foot and lower portion of the right leg were colder than those of the opposite side. The limb above the knee was much swollen. No pulsation could be felt in either the anterior or posterior tibial artery.

On the afternoon of the following day the foot and rather more than the lower half of the leg were of a dull-red color, fading into a deep yellow three inches below the knee. The foot was cold and quite insensible, and no pulsation could be detected in either of the tibial arteries. The loss of sensation and the coldness ceased about half an inch below the livid line. From the knee to Poupart's ligament the whole thigh was greatly swollen, hard, tense, and elastic to the touch. After a careful examination no thrill or pulsation could be detected in any part of the swelling. The femoral artery was felt beating with a jerking pulsation just below Poupart's ligament, but its pulsation could be traced for only a few inches down the thigh. The patient had passed a restless night. Temperature 103°; pulse 130.

June 25th.—No sleep at night. Wandering delirium at times. Temperature 104.1°; pulse 126. The foot had become much darker, and was distinctly gangrenous. The swelling of the thigh did not seem to have increased, but felt very hard. With great hesitation, the patient consented to have the limb amputated. At three P.M. (forty-nine hours after the accident) the limb was removed in the middle of the thigh by antero-posterior skin flaps. A couple of turns of an india-rubber tube made an effectual tourniquet. The subcutaneous tissue was infiltrated with blood and serum, resembling a dark-colored jelly. On making the circular incision through the muscles, a pint or more of dark fluid blood escaped. The patient was very delirious for some hours after the operation, but became quieter towards night. At 9.30 P.M. the pulse was 120, and the temperature had fallen to 102.4°.

22nd.—Slept at intervals during the night. Towards morning had a good refreshing sleep of some hours. During the next four or five days the pulse continued at about 100, the temperature ranging between 101° and 103°.

After July 1st the temperature had fallen below 100°. There was a good deal of sloughing of the anterior flap. With this exception the patient advanced steadily towards convalescence, and was able to leave his bed by the 20th July.

*Examination of the limb after removal.*—The popliteal space was filled with dark fluid blood, and the surrounding structures were all stained of a deep-claret color, which rendered the recognition of them very difficult. On tracing down the popliteal artery it was found completely torn across just above its division, the ends being separated an inch and a half. The calibre of the last inch of the upper portion was so contracted as scarcely to admit a small probe, but did not contain a clot; the sheath, drawn out and terminating in a fine point, projected an inch beyond the vessel and contained a soft coagulum. The lower portion, containing a small soft clot, had also retracted some distance within the sheath, but its calibre was not much diminished. The nerves were uninjured. The tibia near its upper end was partially fractured, the line of fracture being oblique, and involving about half the thickness of the bone.

It may be remarked that rupture of the popliteal artery from violence, without external wound, is not an unfrequent accident. The mechanism of this lesion would appear to be the result of a force acting in an oblique direction from below upwards, on the lowest part of the femur. Dr. S. Pozzi, of Paris, in an interesting paper on rupture of the femoral artery (*Bulletins de la Société Anatomique*, 1868), has called attention to the frequency of the rupture of an artery just above the giving off of some large branch. Many authors have noticed the same fact. A reasonable explanation would be that the vessel, being drawn upwards, gives way just above the point of greatest resistance, the resistance being offered by some lateral branch. The case reported is a good example of this, the popliteal artery giving way just above the origin of the anterior tibial.

Judging from the records of this accident, amongst which should be mentioned twenty-seven cases reported by Poland in the third series of Guy's Hospital Reports, it would appear that the symptoms depend mainly on the extent of rupture, and that the treatment must vary accordingly. The entire absence of pulsation in a rapidly formed and diffused swelling of the ham and thigh, the total cessation of the pulse in the anterior and posterior tibial arteries, and great coldness of the limb, would indicate complete rupture of the artery, with contraction and plugging of its ends. On the other hand, a pulsating swelling in the ham, more or less pulsation in the tibial arteries, and the maintenance of the natural warmth of the limb, would point to a partial rupture. In such a case the artery would be still pervious to the flow of blood, a portion of which passing along the natural channel would keep up the circulation in the leg, while part escaping through the rupture in the artery would communicate its pulsation to the extravasated blood in the limb.

Four lines of treatment have been suggested

and practised:—1. Pressure. 2. Ligature of the femoral artery. 3. Ligature of the vessel at the seat of rupture. 4. Amputation. In case of complete rupture, it is difficult to conceive that any good can result from the employment of either of the first two methods. Circulation in the leg has already ceased, and pressure or ligature of the femoral obviously cannot restore it. Respecting the application of a ligature at the ruptured point, it should be remembered that the stoppage of circulation in the leg may in some measure be due to pressure of the extravasated blood on the collateral vessels. If the limb were not already cold, free incision might possibly allow the collateral circulation to be re-established, and gangrene thereby averted. This treatment was tried in two cases, by Guthrie and Travers respectively, but in neither case could the injured vessel be discovered. Guthrie's patient lost the limb by gangrene. Travers's patient died of secondary hæmorrhage. In another case Poland tied both ends, but gangrene and death followed. Experience has proved that amputation affords the best chance of life, and should undoubtedly be performed as soon as gangrene has declared itself. Most authorities agree that it is useless to wait for the establishment of a line of demarcation.

In cases of partial rupture there is much less tendency to gangrene. As the circulation is not entirely cut off, some hope of saving the limb may be entertained. Carefully adjusted pressure on the femoral has succeeded, and should be first tried. Of ten cases in which the femoral artery was tied, five recovered with useful limbs, while five died from gangrene. Some of these deaths might probably have been prevented if amputation had been performed immediately after the appearance of gangrene, but no further operation was done in any of the five cases. According to Pelletan, the proportion of recoveries when an attempt has been made to tie the vessel at the wounded spot is rather more favorable than the above. But the great difficulty so often experienced of finding the vessel, owing to the disorganised state of the parts, the large extent of the necessary wound, and the risks of secondary hæmorrhage, would doubtless in many instances lead the surgeon to try a ligature low down on the femoral rather than attempt to find the wounded vessel. Unfortunately, gangrene may follow either of these operations, and the limb has to be removed. But if the amputation be performed immediately on the appearance of mortification, the chance of life cannot be seriously diminished by the previous operation and attempt to save the limb.

## SOUTH LONDON OPHTHALMIC HOSPITAL.

### TWO CASES OF SCLEROTOMY FOR GLAUCOMA.

(Under the care of Mr. NETTLESHIP.)

In the first of the two following cases Mr. NettleSHIP performed sclerotomy for the relief of pain and increased tension, which had continued to relapse after repeated iridectomies in an eye already far gone in glaucoma. The sclerotomy has been so far successful that since its perform-

anoe, seven months ago, the patient has been very nearly free from pain, and the tension has never again been above the healthy standard.

In the second case sclerotomy was performed on an eye painful and quite blind from glaucoma, iridectomy being chosen for its fellow eye, in which some sight still remained. Both operations were successful in relieving the symptoms, but the tension was somewhat more reduced by the sclerotomy than by the iridectomy.

Hæmorrhage into the anterior chamber and into the vitreous occurred at both the sclerotomy operations, but in both the blood into the vitreous was almost completely absorbed in a few weeks. This result, although of little consequence if the operation were performed almost as an alternative to excision of the globe, would, if it were unpreventable, be a serious drawback to the usefulness of the procedure on any but blind eyes. Mr. Nettleship thinks, however, that in both his cases the scleral wound may have been made somewhat further from the cornea than is needful, and that the ciliary processes for this reason were probably wounded. Both the cases present other points of more general interest.

CASE 1.—Mrs. W—, aged fifty-three, admitted Feb. 5th, 1875, with acute glaucoma of the left eye, of two weeks' duration; V = shadows; pain severe. Free upward iridectomy was done the next day (the 6th). The pain temporarily relieved, and vision improved, so that she could count fingers. On the 18th severe pain, referred to the temples, had returned; tension again somewhat increased. Second iridectomy downwards, only a small piece of iris being removed. The pain was relieved, and vision improved up to about 18 Jaeger.

On March 10th there had again been severe pain in both eyes, but worse in the left, which was now slightly congested, and its tension decidedly increased. She remained under various local and general treatments, but without further operative measures, until Sept. 15th, suffering at times from severe pain in the eye; the tension remaining somewhat increased throughout, and vision slowly sinking, so that on July 14th she could with this eye barely see letters of 20 Jaeger held to the temporal side; the lens became slightly more hazy. During one attack in April the tension was noted to be  $+2$  or 3. On one occasion the pain was very much relieved for a time by the artificial leech. Mercury and iodide of potassium were given for some weeks on the supposition that the choroidal disease in this eye might be syphilitic, and her symptoms modified by that diathesis.

On Sept. 15th simultaneous double iridectomy was performed inwards and outwards, the iris being thus divided into four parts, and the pupil acquiring a sort of diamond shape. The piece of iris removed from the inner wound was, however, small.

The tension was below normal for a few days, and all pain relieved for a fortnight, after this operation. In October, however, tension was again increased, and she had again had more than one attack of pain. Relapses of severe pain in the eye and corresponding side of the head continued; leeching relieved it only for a short time. Although she complained very much of the pain, the eye was never, when she attended, in the least congested, and the increase of tension was exceedingly slight. She said, however, that it had

been sometimes bloodshot, and that the sight was worse on some days than on others.

On March 4th, 1876, sclerotomy upwards was performed. The anterior chamber, which was extremely shallow, filled with blood during the operation. The scleral wound bulged a little for the first fortnight, but afterwards gradually became quite flat, a narrow dusky scar alone remaining. A small red opacity remained in the front part of the vitreous for many weeks.

It is now seven months since the operation. She has been seen repeatedly. The tension has remained normal, and she has had scarcely any pain. Before the sclerotomy she was often kept awake by the pain; now she never is. The disc has been from her first admission grey and cupped, and there is some nuclear haze of lens. There had no doubt been chronic glaucoma before the acute attack. At the lower part of the equator and fundus is a long broad strip of diseased choroid, widest in front and gradually narrowing off behind, and consisting of little whitish patches, often confluent, and quite free from pigmentation. It probably marks the inner surface of a longitudinal scleral staphyloma.

The patient's right eye became glaucomatous a few days after the second iridectomy in the left, having been in a threatening condition before, and vision far from perfect (she could not read, and it was difficult to test her accurately). A single iridectomy was followed by permanent relief, sight remaining about as at the date of admission; once only she complained of some threatening of a relapse. The disc in this eye is not cupped, and there is no choroidal disease; the nucleus of the lens is probably not quite clear.

The patient had had good health till about two months before the acute attack in the left eye, when she had, within a few weeks, three attacks of imperfect left hemiplegia without affection of the face or loss of consciousness. After this she became nervous and weak, and on admission looked older than she was. She has had fourteen children. It is interesting, in regard to unsymmetrical peculiarities, to note that her mother, after having several seizures, was paralysed on the left side.

CASE 2.—Harriet O—, single, fifty-two, admitted April 19th, 1876, with double chronic glaucoma. History of premonitory symptoms (rainbows, pain in top of head and sides of nose) for five or six years, and of occasional temporary dimness (probably accommodative) since she was twenty years old. Definite failure of right eye began about four months before admission; left had probably been quite blind for much longer, though she did not know it.

On admission—Right eye: V = shadows, but cannot count fingers; T  $+2$  and other signs of subacute glaucoma. Media nearly clear, disc gray and moderately cupped; well-marked spontaneous arterial pulsation. Left eye: No perception of light; tension thought to be slightly less than in right; pupil dilated and oval; cornea very hazy; disc (dimly seen) very deeply cupped. Both eyes painful.

Iridectomy upwards in right, sclerotomy upwards in left.

The iridectomy was successful in keeping what sight remained for the right eye, and tension has remained normal or a little to high.

The sclerotomy has permanently reduced ten-

sion, so that it has always been since the operation slightly less than in the right. Both eyes have been free from pain since the operations.

After the sclerotomy the lips of the scleral wound were widely separated (by about 1-12 inch) for several weeks, and for a time there was some bulging. The protrusion, however, had quite disappeared about two months after the operation, and the scar diminished in width till it became a narrow, perfectly flat, gray line. The anterior chamber filled with blood during the operation, and extensive bleeding took place into the vitreous; six weeks after the operation the latter had cleared enough to permit a dim view of the disc. There was also much subconjunctival ecchymosis over the whole visible part of the eye, and the yellow staining left by this had not quite disappeared at her last visit, four months afterwards. The upper part of the iris had become a little displaced towards the scar.

This patient had been stout and full-colored till some little time before her sight failed, when she quickly lost flesh, although retaining a very large appetite, became liable to pain at the top of the head, noises in the head and giddiness, and to temporary failures of vision and of color perception (*etc.*). She has had no difficulty in shedding tears, and no contraction of palmar fascia. Since scarlet fever at two years her right lower limb has been paralysed, the extensors being quite powerless, and the flexors having become shortened. At forty years old she had severe articular rheumatism, and recently, while under care, had some rheumatism in her back. In other respects she had had good health until the illness of which the glaucoma appears to have formed a part. She is now pale, thin, and depressed. Her urine contained neither albumen nor sugar.

### COVENTRY AND WARWICKSHIRE HOSPITAL.

#### INTESTINAL OBSTRUCTION, FOLLOWED BY PERFORATIVE PERITONITIS.

(Under the care of Dr. MILNER MOORE.)

The following notes and remarks have been supplied by Mr. G. Herbert Lilley, resident medical officer.

The patient, a youth aged nineteen years, was admitted here for the first time on Sept. 21st, 1875, under the care of Dr. Lynes, suffering from colicky pains in the abdomen (more severe on the left side than elsewhere), constipation, and occasional attacks of vomiting of short duration, the matter vomited being nothing more than partially-digested food. He was treated with opiates, mild enemata, and warm baths, and was discharged on Oct. 22nd, apparently cured.

On June 4th, 1876, he was readmitted with a return of the old symptoms, though somewhat intensified. On this occasion there was marked dullness in the left hypochondriac region, and a hard mass could be felt externally, occupying a considerable part of this region. A warm bath was ordered, and an enema containing an ounce and a half of castor oil to two pints of warm soap-and-water was administered while the patient was still in the bath. The enema brought away a great

quantity of scybala, and produced almost instant relief. He was put to bed, hot linseed poultices were applied to the abdomen, and half a grain of opium was given in a pill every six hours. In less than a week patient could walk about, his bowels acted regularly, and he expressed himself "as well as ever." He was discharged on June 18th.

On June 19th he was again admitted with obstinate constipation and vomiting of stercoraceous matter. He complained of intense pain of a radiating character, extending from the umbilicus towards the left side of the abdomen. There was marked tympanites everywhere below the upper division of the abdominal cavity, while complete dullness extended from the right hypochondrium, through epigastric and upper part of umbilical regions to left hypochondrium. The previous remedies were again resorted to, excepting that half a grain of opium was given every four hours. The enema again succeeded in bringing away a quantity of hard feculent matter, and caused immense relief. He remained in bed for some days, enveloped in hot fomentations, when he was again allowed to sit up a few hours daily, and a mixture was prescribed of five drops of solution of acetate of morphia, thirty drops of tincture of hops, in an ounce of infusion of pale chinchona bark three times a day. In about a fortnight arrowroot and light meats were substituted for milk and beef-tea. Health and strength continued to improve, until he was again discharged as cured on July 21st, 1876. At the time of leaving the hospital his appetite was good, his bowels regular, and there was a total absence of pain and tenderness over the abdomen.

On August 15th patient returned with all the symptoms present on the previous admissions much intensified in character: abdomen tense and much distended, dullness in flanks and at upper half of anterior surface; tympanitic resonance at lower half; great tenderness on pressure; constipation; vomiting of stercoraceous matter at first, but of dark fluid resembling altered blood before death; pulse 180 and very feeble; features haggard and pinched; urine scanty, high-colored, and voided with some difficulty. A decided loss of flesh observed since last discharge from the hospital. All the remedies hitherto adopted were again tried, but without any appreciable result. In spite of effervescent, ice, &c., almost incessant vomiting set in, and continued until midday of August 16th, when the patient succumbed.

*Autopsy, forty-eight hours after death.*—On opening the abdominal wall a quantity of very fetid gas escaped; the peritoneum was everywhere adherent to the abdominal parietes, and extremely vascular. In the pelvis some considerable effusion of dirty, semi-purulent, serous fluid was found. The small intestines were swollen and much congested, and the transverse colon was hard and enormously distended. There was increased vascularity over the whole of the exposed intestinal surface, and more especially where the coils met; irregularly-dispersed flakes of lymph were dotted over the various abdominal organs. On removing the large intestine from the cavity of the abdomen, the length from the cæcum to the lower end of the rectum was a little more than 4 ft. The diameter of the colon at the cæcal end measured 1½ in., at the middle of the transverse portion 12 in., and at the splenic flexure 11½ in. The thickness of the wall of this portion of the colon amounted to



about one-third of an inch. The mucous membrane of the colon throughout its entire length was found to be studded with numerous black impressions, each corresponding in size with fruit seeds, which abounded in the fecal matter contained in this part of the intestine. On measuring the quantity of the retained excreta, there was almost sufficient to fill two ordinary-sized washhand-basins, and it was principally composed of nodular masses, each having as a nucleus a cherry- or damson-stone (a great number of these stones being found in the interior of this portion of the colon). At the cæcal end there was a perforation at the base of the vermiform appendix, a small ulcer being present about the size of a large pea. The greater part of the appendage itself had sloughed away. At this point some fecal matter had escaped into the peritoneum. At the opposite end of the colon, immediately beyond the splenic flexure, the intestine had become so contracted as to admit with difficulty the end of the little finger, while at the angle of flexure itself there was a mass of infiltrated and disorganised bowel-tissue, dense and fibrous on its outer aspect, but soft and friable on the inner. Here perforation had taken place to some considerable extent. There was a hole, about the size of half a crown, situated in this mass, and communicating directly with the peritoneal cavity, and a quantity of fecal matter had forced itself through the opening. Near to this spot the wall of the intestine was extremely thin in places, from an extension of the ulceration along the mucous membrane. Beyond the constriction in the gut, the descending colon and rectum were found empty, and appeared atrophied to some extent.

From the history of the case it would appear that the constriction of the intestine was the result of repeated attacks of enteritis, leading to cicatrization, and that for at least a year some obstruction in the bowel had been present. Although no foreign substances had been observed in the excreta, liberated by the enemata on the three previous administrations, yet it is probable that each attack of obstruction was the result of some foreign body interfering with the onward flow of fecal matter at a point where the vermicular action was already weakened by cicatricial tissue. It was known that the patient had been in the habit of eating the most indigestible of food to ward off hunger. From the amount of collapse present before death, and from the extensive perforation of bowel, and consequent amount of fecal extravasation—evidently post mortem—it is manifest that the fatal result was due to the over-distension and rupture of the bowel at its weakest point. The smaller perforation at the cæcal end must have been secondarily induced.

### STANLEY HOSPITAL, LIVERPOOL.

#### COMPOUND FRACTURE OF THE JAWS; WIRE SUTURE.

(Under the care of Mr. RUSHTON PARKER.)

A BOY, aged twelve, was brought to the hospital on Sept. 4th, 1875, having, half an hour previously, fallen about six feet into a neighboring sandstone quarry, some of the loose stones of

which were displaced and fell with him, crushing and injuring his head and face. There was moderate bleeding from the right ear, the left cheek was raw from abrasion, and the lower lip was split and ragged all over the red margin. The facial surface of the left upper jaw was obviously sunk below its proper level backwards, its front teeth and their alveoli were driven in and broken, and a perceptible difference of level could be felt between the halves of the hard palate. The lower jaw was broken through on the left side at the first bicuspid tooth, the fragments being much displaced and exposed in the mouth by laceration of the gum, the direction of the fracture being oblique downwards and backwards.

In about an hour later the lower jaw was drilled and wired, the upper jaw being disregarded, as it was quite firm in its depressed position. By this time there had occurred intense ecchymosis of the eyelids and great pallor of the uninjured parts of the face, while in addition the increased redness and rawness of the left cheek gave him altogether a somewhat frightful appearance. He was still bleeding from the ear, and had a very feeble and quick pulse, but he was quite conscious and free from pain.

Before the bone was fixed the tooth at the seat of fracture was withdrawn. Two drillings were made, one in front of, and the other behind, the fracture, both being directed at a level below the dental canal, to avoid its contents. In drilling the anterior fragment the lower lip was turned down, the bone and gum being alone pierced; but in the case of the posterior fragment the hole had to be made behind the angle of the mouth, so the cheek and bone were pierced together, and the wire passed through both; the wire was then picked up from inside the cheek by incising the mucous membrane under which it lay, the hole in the cheek being then done up, and left to heal. The wire was passed through one hole from outside and returned through the other from inside, and to effect the latter movement a tubular needle was passed from outside and withdrawn, after inserting the end of the wire into its tip. Each end of the wire was then twisted into a cylindrical spiral coil between the cheek or lip and the bone by means of a steel rod, with a slit at the end to catch the tip of the wire, which was thus held fast and coiled round the rod until it was tight enough. Perfect apposition was thus infallibly attained. The next day the steel rod, or key, was inserted into one of the coils and turned to secure tightness, but no further interference was required.

The bleeding from the ear ceased within a few hours of the accident; the boy was kept in bed about a week, and fed on liquid diet for a fortnight, during which time he enjoyed his night's sleep, and tolerable immunity from pain and discomfort. No dressings of any kind were used, and the only subsequent treatment employed was frequent ablution. The wire was cut in the middle, and withdrawn after twenty-six days, firm union having existed about ten days. An abscess formed in the cheek, and left a sinus leading to bare bone; but this was all healed in ten weeks after the accident. He lost the left upper canine tooth, and the three adjacent incisors with their alveoli; and the left lower second milk molar was replaced by a permanent bicuspid.

The steel rod or "key for coiling the wire, and

other tools required in similar cases have been devised by Mr. Hugh Owen Thomas, of Liverpool, and fully described and illustrated in his pamphlet.

Mr. Parker's attention was first drawn to the "key" by Mr. Berkeley Hill, who used it when wiring a jaw which he had divided for the removal of a tongue at University College Hospital in 1869.

This is obviously the simplest, neatest, and most efficient treatment of compound fracture of the lower jaw which has been yet devised, and is satisfactory to both patient and surgeon alike. The instruments employed were made by Krohne and Sesemann, and the ordinary copper wire of bell-hangers (about one-thirty-second of an inch thick) cannot be surpassed for the purpose.

### NORTHERN HOSPITAL, LIVERPOOL.

#### DOUBLE FRACTURE OF INFERIOR MAXILLA; WIRE SUTURE.

(Under the care of Mr. CHAUNCEY PUZEY.)

EDWARD S—, a seaman, was brought to the hospital on July 8rd, having sustained a double fracture of the lower jaw. One fracture was compound, between the right canine and bicuspid teeth; the other simple, oblique, a little anterior to the angle on the left side. The injuries had been received in a fight whilst the man was drunk. As the case proved difficult of treatment, the patient was admitted into hospital. Various methods were tried, but all found more or less ineffectual; the fragments could be with some difficulty placed in good position, but it seemed impossible to retain them, the muscles of the tongue and floor of the mouth very soon displacing the anterior fractured portion, and causing great pain. Therefore on the 18th, ten days after the injury, the operation recommended by Mr. H. O. Thomas was performed. The anterior fracture only was wired. The bicuspid tooth having been extracted, the drill was passed through each fragment at the reflection of the mucous membrane, about three-quarters of an inch from the fracture, and the fragments were wired together by the copper bell-wire coil, as described in Mr. Rushton Parker's case. The posterior fracture was not touched, but to assist in steadying it an ordinary four-tailed bandage was afterwards applied. Nothing further was required. All pain and trouble ceased, as evinced most remarkably by the change in the patient's temper and manners.

On the 4th of August he became an out-patient. There was by that time no mobility at the seat of the anterior fracture; but as there was some slight pain on movement about the situation of the posterior fracture, and as the suture did not cause the slightest inconvenience, the wire was not removed. He did not attend regularly after his discharge, but was seen by Mr. Farnell, the house-surgeon, on the 19th August. The fractures appeared firmly united, and he was told to come next day to have the suture removed. He did not do so, and when inquired for a few days afterwards, it was found that he had gone to sea, having probably been engaged during the intervening time in spending his spare cash in drink. However, there could be no doubt that the operation had resulted quite satisfactorily, both from a surgical point of view and as

regarded the comfort of the patient. By this operation, the heat and discomfort of bandages, the trouble of rearranging appliances, and the necessity for keeping the jaws fixed, are avoided—a source of relief both to patient and surgeon.

#### COMPOUND COMMINUTED FRACTURE OF SUPERIOR MAXILLARY BONES; WIRE SUTURE.

(Under the care of Mr. CHAUNCEY PUZEY.)

A dock laborer, aged twenty-eight, was admitted into the hospital on Jan. 12th, 1876, suffering from severe comminuted fracture of both superior maxillæ. Whilst at work at a crane he had been overpowered, and the winch-handle, revolving rapidly, had struck him in a direction from below upwards on the mouth, grazing the lower lip, shaving off the crowns of all the lower front teeth, and smashing or knocking out all the upper incisors and canines. All the alveolar portion of the right superior maxilla posterior to the canine tooth was hanging down on the tongue, suspended by the mucous membrane of the hard palate; the bony palate was fissured from before backwards, the floor of the antrum was comminuted, so that the finger passed readily into that cavity; the finger could be passed from each nostril into the antrum of the corresponding side, and crepitus could be felt under each orbit, both maxillary bones being evidently fractured vertically through their whole extent. The large detached portion was brought up into position, but it was necessary to remove several pieces of antrum, which lay in such a position as to interfere with its reduction. The two portions of right maxilla were then drilled at a level with the reflection of mucous membrane, about three-quarters of an inch from the line of fracture, and were then fixed together by two thicknesses of stout silver twisted suture. The line of teeth then corresponded accurately. Wine and fluid nourishment, and frequent syringing of the mouth and nose with Condy water, was the after-treatment.

For a day or two there was some sanious discharge from the nose and mouth, and in the course of a day or so later profuse purulent discharge from the nostrils; swelling and discoloration of the whole of the face occurred, the eyes being completely closed, and the face presenting the appearance of erysipelas, or rather of glanders. There was, however, no constitutional disturbance, and the condition was evidently due merely to extravasation of blood.

Ten days after the injury the swelling was fast disappearing, but the large fragment of bone was found loose, and it was seen that the suture had given way at the twist. This was removed, and a thicker wire was passed, which remained firm until the termination of the case.

Four weeks after the accident all swelling of the soft parts had disappeared, and there was much less mobility of the fracture. In a week or two more the patient was about to be discharged as an out-patient when great swelling of the *left* cheek and palate suddenly occurred, and in a few days an abscess opened itself into the mouth, and shortly afterwards a small fluctuating swelling was opened just below the left infra-orbital ridge. A small quantity of air and pus escaped from this opening, and through it a probe could be passed into the antrum, and bare but not loose bone detected at a considerable depth.

On the 18th of March the man became an out-patient. There was still slight mobility at the site of the principal fracture. The wire suture was therefore left in; in fact, it was not removed until June, for it appeared to cause no irritation or annoyance, and it was thought that, in consequence of the great loss of bone, osseous union would be but slight.

In July a small fragment of bone was discharged from the opening below the left orbit, and the sinus, which had remained open with slight intervals for four months, closed.

On the 28th of August he was well. There was no deformity except from the loss of the teeth, and a slight gap in the alveolus at the site of the principal fracture. The line of the jaws was perfect. He was transferred to the care of the dental surgeon, for the purpose of being provided with false front teeth.

### ST. THOMAS'S HOSPITAL.

POPLITEAL ANEURISM; APPLICATION OF ESMARCH'S BANDAGE FOR ONE HOUR, AND OF THE TOURNIQUET TEMPORARILY AFTERWARDS;  
RECOVERY.—REMARKS.

(Under the care of Mr. WAGSTAFFE.)

The following notes were taken by Mr. Edmunds, house-surgeon, and Mr. Cockell, dresser.

R. W—, a barman, of good physique, aged thirty-two, was admitted September 1st. Between four and five months previously, when pushing a heavy cask, he felt "something snap" in his right leg at the back of the knee, and he suffered for the next three days from severe pain in this situation, but did not discontinue his work. He felt pain there afterwards on and off after a hard day's work. Two months prior to admission he first noticed "throbbing" at the back of the right knee, attended for the last month with swelling of the leg and "dragging pain" at the back of the leg and ankle; but he was able to continue his work until admitted.

On admission, there existed in the popliteal space a pulsating aneurismal tumour, two inches long, filling the upper half of the space, terminating opposite the junction of the femur with the tibia, together with considerable oedema of the leg.

On Sept. 2nd an Esmarch's bandage was applied tightly over the foot and leg up to the lower border of the popliteal space, carried lightly over the tumour (a thin layer of cotton-wool intervening), and then continued tightly over the thigh to within three inches and a half of Poupart's ligament, where the upper end of the bandage was fixed with pins. The elastic ligature was not used. This was completed at 2 P.M. The bandage was then left on for one hour, during which time the patient was very restless and complained of great pain. One-third of a grain of morphia was given subcutaneously. At 2.55 P.M. a tourniquet was placed on the femoral artery, and Esmarch's bandage was removed. A second tourniquet was placed in position, to be applied alternately with the first.—4 P.M.: No pulsation in tumour when the tourniquet was removed for a few moments.—5.45 P.M.: Application of the tourniquet continued;

no pulsation in tumour; leg slightly swollen; toes warm.—9.30 P.M.: Until this time complete pressure had been kept up by tourniquets, but some flow of blood was now permitted.

8rd.—8.45 A.M.: When all pressure was taken off, no pulsation was felt in the tumour. Tourniquet still applied lightly.—At 12 noon there was no pulsation in the tumour, but the artery on the inner condyle pulsated.—7 P.M.: Tourniquet loose; taken off. Aneurism cured.

On the 10th the aneurism remained only as a solid lump in the popliteal space, and over each condyle was a rather large artery pulsating very freely. The foot was not swollen, and the man was free from pain.

*Remarks by Mr. WAGSTAFFE.*—The value of the principle which Prof. Esmarch has been most active in utilising in his method of ensuring bloodless surgery has been recognised in England perhaps more fully than abroad; and one of the latest adaptations of it is in the treatment of aneurism. The only case in which I am aware of an attempt having been made to cure this disease by means of Esmarch's bandage is that of Dr. Walter Reid, reported in *THE LANCET* for 1875; and in this case, which was one of popliteal aneurism, other means had been previously adopted: genuflexion for four days; complete compression of the artery for four hours, after which pulsation in the tumour ceased for a time; and then a number of attempts were made both by digital and instrumental compression before using Esmarch's bandage. So that, although there is no doubt that ultimately the complete emptying of the limb of blood by means of Esmarch's bandage allowed the aneurism to consolidate, still one cannot help feeling that the previous treatment may have materially assisted in the cure.

In the case here narrated the limb was emptied of blood for nearly an hour, the sac of the aneurism being left probably full, and then the main artery compressed by tourniquet for an hour longer, before the tumour was examined. At the end of that time no pulsation could be detected when the tourniquet was raised. Still it was thought advisable to continue the pressure, and this was probably nearly complete for the next five hours, after which it was maintained only imperfectly for twelve, and very slightly, if at all, for the next ten hours. The plan here adopted of leaving Esmarch's bandage compressing the whole limb, except the aneurism itself, for an hour, appears simpler and open to less objection than that adopted by Dr. Reid, of removing the bandage after encircling the upper part of the limb with the elastic ligature, inasmuch as it substitutes a universal for a local pressure; and doubtless, if it were thought advisable, the bandage might be left on longer, though it would be necessary to administer chloroform in that case, owing to the pain it produces. Many cases of necrosis remain under chloroform, with no blood admitted to the limb, a longer time than was occupied in the treatment of these two cases of aneurism—i.e., longer than an hour.

The treatment here adopted is undoubtedly more reliable than digital or instrumental pressure, but whether so successful in large thinly-coated aneurisms remains to be proved. The sac is presumably occupied by the clotting of the contained blood *en masse*, and not by a lamination from the wall

inwards, and it remains to be seen whether this would ensure permanent obliteration in large aneurisms.

## Editorial.

### STRUCTURAL CHANGES IN THE LIVER PRODUCED BY OBSTRUCTED OUTFLOW OF BILE.

ABOUT three years ago Dr. Wickham Legg published in the St. Bartholomew's Hospital Reports a series of experiments undertaken with a view to demonstrate the effects upon the liver itself of ligature of the common bile-duct. It was a field which had not been much worked upon, and Dr. Legg's numerous experiments were a valuable contribution to pathology. In the present year the same question has been studied jointly by MM. Charcot and Gambault, the former having chosen the pathological anatomy of the liver as the subject of his lectures during the past session. These observers contribute the results of their labors to the current number of the *Archives de Physiologie* in a paper of much interest. Referring to Dr. Legg's observations, they state that they had pursued the same subject in order to push the conclusions further than he did. Their paper is founded on the examination of the livers of guinea-pigs, in whom they tied the common duct. Seven animals were taken, and they either died or were killed at different intervals after the ligature—viz., five at periods varying from the fifth to the twelfth day, one was killed on the tenth, and one survived until the twenty-third day. In the main their observations tally with those obtained by Dr. Legg, the differences that appear between the two sets of experiments being probably in great part due to the different kind of animal—viz., the cat—upon which Dr. Legg operated, and the length of time which elapsed between the operation and death. One striking difference was that in their experiments, even in the case of the animal which lived twenty-three days, there was never any trace of jaundice, nor any appearance of bile in the urine, although the duct had been completely occluded.

After describing the steps of the operative measures, they proceed to discuss the appearances presented by the liver and its appendages after death. In all cases the organ was enlarged and indurated, of a pale-yellow color, and sometimes of a nutmeg appearance; the gall-bladder and the hepatic and cystic ducts were distended with bile mixed with mucus, and there was inflammatory induration in the hilus of the liver and some local

peritonitis at the seat of operation. During life the creatures showed simply wasting and loss of appetite, and in some instances they even rallied from this, and had to be killed for the purpose of examination. In no case was the liver granular, as in some of the instances observed by Dr. Legg, but this is believed by the authors to be due to the greater length of time which those animals survived in which the granulation was present. Microscopical examination showed dilatation of the bile-ducts in the portal canals to ten or fifteen times their normal diameter, and, in spite of this, the epithelial lining of the ducts was preserved, giving evidence of considerable proliferation of this epithelium. Sometimes the ducts were filled with bile, in other places they were empty. The spaces and fissures between the lobules were much enlarged, and there was marked evidence of perilobular sclerosis, in the presence of an infiltration of small cells encroaching on the lobules on all sides. In the midst of this new tissue the sections showed a very large number of ducts and small anastomosing channels, in part due possibly to a varicose condition of the ducts, leading to their being cut in different directions, so that the same section brought into view several portions of the same duct; and in part also due to the dilated bile-capillaries in the outer parts of the lobule being rendered evident by the disappearance of the cells between which they normally run. The amount of these changes was proportionate to the length of time that elapsed between the ligature and the examination, but even in the shortest intervals some sclerosis was present, showing that the process must be of very rapid evolution. As to the lobules themselves, they were more or less irregular in outline and diminished in size, but it was evident that the change produced was due simply to the gradual disappearance of the outermost cells in the lobule, for the portions of each lobule that remained still preserved the radial arrangement of their cell columns, and their constituent cells were still intact. Here and there an atrophied cell could be observed in the midst of the newly-encroaching connective tissue. Fatty degeneration of the cells was only exceptionally observed; they seemed to disappear by a process of simple atrophy, and in some instances to undergo a kind of vitreous change of their protoplasm, the nucleus of the cell remaining. In all the livers examined the leucocytes between the lobules were here and there grouped into small masses, evidently commencing abscesses.

MM. Charcot and Gambault differ from Dr. Legg with regard to the pathogeny of this state of liver. Whereas he believes that the sclerosis is a primary condition, the result of an inflammatory process, having its starting-point in the irritation set up by the ligature around the duct, the present authors, on the other hand, hold that this indura-

tive change in the hepatic parenchyma depends upon the fact of bile retention; not simply to the rapid dilatation of the ducts but probably also to some change that takes place in the retained fluid itself. In one of their experiments a number of vibriones were found in the cystic bile immediately after death. The retained bile acts first upon the mucous membrane of the ducts, producing the proliferation of epithelium above mentioned. The irritative process then involves the other coats of the ducts, the tissue composing Glisson's capsule, and the thin connective bands that separate lobule from lobule. As a result of this irritation, there is more or less accumulation of inflammatory growth around the lobules, encroaching on them at their margins, and causing the gradual disappearance of the cellular structure. It is a true sclerosis, and a similar (although perhaps not quite the same in its anatomical origin and distribution) effect follows ligation of the portal vein. The authors promise a further paper upon the varieties of hepatic sclerosis.

In the human subject an indurated liver has frequently been noted in cases of obstructive jaundice, and the authors show, from a minute examination of a case recently under the care of M. Charcot, that these indurative changes are precisely similar in kind to those met with in the guinea-pig in whom the common bile-duct has been ligatured. They believe, moreover, that the "biliary abscesses" which are sometimes found in these cases arise in precisely the same way as the sclerosis—that is, that they are formed outside, and not within the dilated and blocked bile-ducts.

#### EXCITATION OF THE CRANIAL DURA MATER.

M. BOCHFONTAINE recently presented a note to the Académie des Sciences on some particulars of the "reflex" movements which are produced by mechanical stimulation of the cranial dura mater. His observations are of great interest, both physiological and pathological. That the membrane is sensitive is shown by the fact that when certain portions are irritated, cries of pain and general movements are produced. But the mechanical stimulation of certain parts produces, under certain conditions, movements limited to one or several parts of the body. The facts were observed in dogs, which were experimented on in order to study the excitability of the grey cortex of the brain. Some were etherised, others chloralised by intravenous injection, and others were slightly stupefied by curara. One part of the skull had been removed to expose the cranial dura mater. Under these circumstances, by scratching gently with the point of a dissecting forceps the

parts of the dura mater situated at the level of the middle of one side of the cerebral hemisphere, the eyelids closed on that side, and sometimes the upper lip was raised, the nose was drawn to that side, and the ear was moved. A stronger irritation occasioned a simultaneous movement of the limbs on the opposite side, and of the tail, which deviated from the side of the irritation. A still stronger irritation, rapidly and several times repeated, determined movements of both sides of the face, of the neck, and of all four limbs. The movements of the limbs on the same side were more energetic than those of the opposite side. The irritation of several points of the dura mater situated anteriorly in the frontal region also caused isolated movements of the eyelids, or of some of the muscles of the face. These movements were not observed when the points were irritated outside or behind the middle portion which was first excited. In the latter case the irritation was followed only by movements of the trunk.

M. Bochefontaine next endeavored to ascertain whether these phenomena, observed when the dura mater was intact, were equally to be observed when it was divided so as to expose the convolutions. He divided the anterior portion of the dura mater into four segments. When the anterior segment was indented with the teeth of the dissection-forceps, whether strongly or gently, there occurred corresponding movements of the limbs, or limited to the orbicularis of the eyelid, just as in the experiments in which the dura mater had been merely scratched with the point of the forceps. The compression of the outer and posterior segments caused no movements limited to the face, and only those of the members and of the different parts of the body. On pinching the inner segment, seven or eight millimetres from the falx cerebri, no movement was produced. Hence the conclusion is drawn that the transmission of the stimulation or irritation of one side of the dura mater is not by any sensory nerve-fibres coming from the opposite side. The results are manifestly not due to any accidental stimulation of the subjacent grey cortex, since this is inexcitable by mechanical agencies. But in order to avoid all chance of error from this cause, M. Bochefontaine repeated his experiments after having removed the grey cortex and the subjacent white substance from the whole of the extent of the sigmoid convolution. The phenomena observed were exactly the same as those noted before the removal of the cerebral substance. It is thus clear that mechanical stimulation of the cranial dura mater on one side will cause contraction in one or more of the facial muscles confined to the corresponding side. To obtain this result, the irritation of the dura mater must be slight, or the animal must be placed under a certain degree of anesthesia. A stronger mechanical stimulation causes, at the same time as

the contraction of the face, movements in the limbs of the corresponding side; and if the stimulation be still more intense, movements occur in all four limbs, those of the same side being moved more strongly than those of the opposite side.

What path is taken by the irritation in passing from the cranial dura mater to the muscles? is a question which at once presents itself. When the movement is confined to the orbicularis of the eyelids the course is a simple one. It can reach the nerves directly as they traverse the substance of the membrane. A similar explanation accounts for the movements of the face on the corresponding side. It is more difficult to understand the mechanism by which the movements are produced in the corresponding half of the body. Were the stimulation direct it would seem that the movements should occur in the opposite limbs. As it is not so, the conclusion is that the stimulation is transmitted directly to the corresponding side of the spinal cord. When all four limbs are moved the irritation is transmitted, both directly and by decussation, to both sides of the cord. But the direct transmission is more intense than that which passes by the decussation of the pyramids.

## Medical Annotations.

"Ne quid nimis."

### THE PHYSIOLOGICAL ACTIONS OF COLCHICIN.

THE most remarkable phenomenon that this agent produces is the complete loss of sensibility from paralysis of both the peripheric and centric nerve endings. The reflex excitability is consequently abolished. On the other hand, the motor nerves and the muscles retain their excitability till death takes place. In many animals the paralysis is preceded by a stage of excitation. That in frogs may rise in intensity till there is an outbreak of tetanic convulsions. The circulation of the blood is only slightly disturbed by the action of the poison. The heart continues to pulsate even after the paralysis of the central nervous system has commenced. The blood-pressure long remains unchanged, only sinking when the animal is moribund, and, in like manner, the paralysis of the inhibitory nerves of the heart occurs at a late period. The respiration becomes gradually less and less frequent, until it is entirely arrested, so that we must conclude that there is gradually increasing paralysis of the respiratory centre. In warm-blooded animals, and especially in cats, poisoned with colchicin, the mucous membrane of the whole gastric and intestinal tract is swollen and strongly injected, whilst the intestine contains bloody mucus. In consequence of this there are diarrhoea, vomiting, and colicky pains during life. The cause of the congestion has not as yet been ascertained. The fibres of the splanchnic and abdominal branches of the vagus are not paralysed.

The kidneys are strongly hyperæmic, and their secretions diminished. The action of colchicin takes place very slowly, death only occurring after several hours; and it is remarkable that, as was observed some time ago by Schroff, the amount of the dose has scarcely any perceptible influence on the intensity or rapidity of the action of the poison. A few centigrammes, and in cats even a few milligrammes, are sufficient to cause death, which results from arrest of the respiration, whilst the heart continues to beat for some time. In this stage tonic or clonic convulsions occur both in cats and rabbits, which Rossbach attributes to asphyxia. Doses smaller than are sufficient to cause death have scarcely any action.

### THE USE OF ALCOHOL.

A CORRESPONDENT asks a question which is pressing for a reply in many minds. What quantity of alcohol may be taken daily, in perfect temperance, and with advantage, by a lady? The answer to the question cannot be an absolute one. Alcohol has two uses, if we are to accept what seems the clear teaching of scientific observation; it is a food and a stimulant. To some extent it is consumed in the system, and yields force; it also directly affects the function of the nervous system. It is its latter use alone which must decide the question of how much may be taken. The quantity which can be utilised in the system as food is so considerable as to be certainly deleterious by its over-stimulating action on the nervous system. Moreover, as a food it has not been shown to have any special advantages. This part of its use may thus be neglected. As a stimulant the quantity really needed is very small, especially when a sedentary life is led. It is probable that in most cases two glasses of wine a day, according to our customary regulation of the size of the glass by the strength of the wine, is as much as can be taken with advantage. By many this is more than is needed. An estimate by the sensation produced is beset with fallacies. The pleasurable sense of stimulation is absolutely misleading. The use of stimulants is to facilitate work, and the ease with which work can be done and the state of body and mind *afterwards* afford a surer test. If the sense of stimulation be the guide, use establishes tolerance, and a larger and yet larger quantity can be taken without the sense of pleasant stimulation being overpassed, but not without permanent damage to the nervous system. Whatever is taken, however, should be taken at meals, once or twice a day. One large, perhaps the largest, part of the beneficial action of alcohol is to aid digestion by its direct action on the stomach, and by its action on the stomach through the nervous system. Alcohol effects most of its evil and least of its good when taken alone. All use of alcohol between meals should be absolutely prohibited.

### BROMIDE OF POTASSIUM AS A CAUSTIC.

In a paper read at the recent meeting of the French Association for the Advancement of Science, M. Peyrand, of Libourne, claims for bromide of potassium certain properties hitherto but slightly recognised—properties which will extend the already wide range of the therapeutical uses of this salt. He found that subcutaneous in-

jection in rabbits of concentrated solutions of the salt led to sloughing of the skin, and from this he was led to try the value of what he considered to be the escharotic properties of bromide of potassium upon malignant and other growths, either by means of injections into the tumour or by the application of the powdered salt to a raw surface. The action of the salt is completely resisted by the tegument. His first clinical experiment on the subject took place in April 1874, when, by means of daily applications of powdered bromide, he effected the removal within twenty-eight days of an epitheliomatous growth on the face. He has since had equally good results from this treatment of atonic ulcers of the legs, rapid cicatrization following the separation of sloughs produced by the application. In such cases he uses either the powder or an ointment of one part in five, or a mixture (one in ten) of glycerine and the bromide. In many skin affections, as chronic eczema, pityriasis, and acne, in phagedæna, ulcerative stomatitis, and many other local inflammatory disorders, he has found it of use. As a local hæmostatic, a solution of one in fifty has served for epistaxis, and as a general hæmostatic its success in many cases of hæmoptysis and metrorrhagia was very marked, where ergot, perchloride of iron, and rhatany had failed.

#### HISTOLOGY OF THE NERVES.

L. RANVIER, in a paper recently published in the *Comptes Rendus*, states that he has been engaged in examining the spinal and Gasserian ganglia of rabbits, by means of interstitial injections of osmic acid. He finds, in accordance with the observations of earlier investigators, that the ganglion-cells are unipolar. But whilst previous observers consider that all such nerve-fibres run either towards the centre or towards the periphery, he has satisfied himself that, after pursuing a longer or shorter tortuous course, each one joins in a T-form with one of the nerve-fibres of the posterior root with which it fuses. This insertion invariably takes place at the plane of one of Ranvier's nodes. Ranvier will not state positively that every single one of the unipolar nerve cell-fibres terminates in this manner, but points out that on breaking up a sensitive root at the level of the spinal ganglion, an extraordinarily large number of these T-formed communications exist. He also draws attention to the possibility that the processes of the unipolar cells may perhaps themselves fuse together to form a common trunk before joining a root-fibre.

#### THE STERNO-CLEIDO-MASTOID MUSCLE.

An interesting paper on this muscle appeared lately in the *Centralblatt*, from the pen of W. Krause, the Göttingen Professor of Anatomy. Its attachments and relations, he observes, are usually considered to be quite certainly made out; yet certain facts in comparative anatomy, as well as its perforation and supply by the nervus accessorius, tend to throw some doubt as to whether it is fully understood. Surgeons may remember to have read that a case of wryneck occurred under the care of

Stromeyer in 1838, in which the cure was not effected by a tenotomy of this muscle, in consequence of the presence of a variety—namely, a cleido-mastoideus secundus. On careful comparison of the great anatomical treatises, it will be found that they may be divided into two groups. In one—commencing with Albinus in 1784, and including D. C. Mayer, 1784; Loder, 1788; Hildebrandt, 1799; Soemmering, 1791; J. F. Meckel, 1816; E. H. Weber, 1839; Thiele, 1841; F. Arnold, 1844; Henle, 1858; Hollstein, 1860; Eckhard, 1862; Luschka, 1862; Sappey, 1869; Quain, Hofmann, 1870; Cruveilhier, 1871; Heitzmann, 1875—the insertion of the sterno-mastoid is given into the superior semicircular line of the occipital bone as well as into the mastoid process. Whilst in the other—including Monro, iii., 1825; C. Krause, 1833; Hyrtl, 1846, 1859; H. Meyer, 1861; Aebly, 1871; and others—the muscle is regarded as being exclusively attached to the mastoid process. Langer, 1865, took up an intermediate position, regarding the insertion into the linea semicircularis as a variety. He stated also that it was the clavicular head or cleido-mastoid that was attached to the semicircular line: whilst Albinus, 1784; Meckel, 1816; and probably also Heitzmann, 1875, attributed this insertion to the sternal portion, or sterno-mastoid muscle.

The sterno-cleido-mastoid is, Professor Krause believes, a complex body composed of four muscles, with the following origins and insertions:—

1. Portio sterno-mastoidea, which arises from the upper border of the sternum, and is inserted into the border of the processus mastoideus and the adjoining part of the temporal bone. This is the strongest part of the muscle, and has a thin tendinous attachment, the apex of which is directed downwards.

2. Portio sterno-occipitalis arises immediately to the outside of the foregoing portion. It is thin, superficially placed, joins, as it ascends, with the third portion, and is inserted into the outer extremity of the linea semicircularis oss. occipitis extending as far as to the insertion of the portio sterno-mastoidea.

3. Portio cleido-occipitalis, belonging to the hitherto so-called caput clavicular. This arises from the clavicle externally to the triangular split which separates the two main portions of the whole muscle. This portion of the muscle is broader or more slender, as a rule, in inverse proportion to the degree of development of the portio-sterno-occipitalis, and is usually broader than the latter. It is superficially placed, and as it ascends joins with the last-named segment, and is inserted into the linea semicircularis on its inner side, occupying the part between the lateral and middle third of that line.

4. Portio cleido-mastoid is the next strongest to the sterno-mastoid portion, arises by a broad attachment from the clavicle immediately behind the portio cleido-occipitalis, is concealed behind the portio sterno-mastoidea, and is thus the most deeply-placed part; is interpenetrated by some tendinous stræ, and is inserted beneath the sterno-mastoid portion into the apex of the mastoid process.

The accessory nerve perforates the portio cleido-mastoidea or passes between this and the portio sterno-mastoidea, runs between the portio cleido-occipitalis and cleido-mastoidea, and emerges be-



tween the two latter. All parts of the muscle, even the portio sterno-occipitalis, receive branches from the nerve.

In mammals sometimes one, sometimes another, part of the muscle is absent. Thus the badger only possesses the sterno-mastoid and cleido-occipitalis, whilst the marten has the sterno-occipital and the cleido-mastoid, and the hare the sterno-mastoid and cleido-mastoid. The ordinary varieties in man are readily explained by the isolation or absence of particular parts, or by the extension of the cleido-occipitalis to the external occipital protuberance. Both the cleido-occipitalis and the sterno-occipital may be very feebly developed, and both may be absent, as, indeed, may also the sterno-mastoid. Or it may happen that the cleido-occipital or the cleido-mastoid may be independently developed. If the cleido-occipitalis extends very far laterally it acquires a surgical interest.

In the following scheme *s m* represents the portio sterno-mastoid; *s o* the sterno-occipitalis arising at *s*, and inserted between *o* and *m*; *o o* the cleido-occipitalis; *o m* the cleido-mastoid, which is more deeply placed. The four portions of the muscles, instead of having eight points of attachment, have only five, for the cleido-mastoid and cleido-occipital are attached above together, the cleido-mastoid and sterno-mastoid below.

Krause observes that if the muscle were named after its attachments it should be called the sterno-cleido-mastoideo-occipitalis, or, better, the musculus quadrigeninus capitis.



the wound, and allowed to remain a sufficient time to come in contact with and dissolve a portion of the ball. The injected fluid is then withdrawn either by syringe or by changing the position of the patient so as to let it run out into two lots. One of them is to be tested with iodide of potassium, when, if lead be present, the well-known yellow color will be obtained. To the other a solution of sulpho-cyanide of potassium is added, which will turn red if iron be present, or ferro-cyanide of potassium to give a blue. It is claimed that the procedure is less irritating to the patient than probing.

DR. W. S. BOWEN, ophthalmic and aurial surgeon to the Hartford Hospital (U.S.), records this month the occurrence in his practice of six cases of disease of the middle ear induced by the use of the nasal douche in treating naso-pharyngeal catarrh. Many will remember that Prof. Roosa published some time since in the *Archives of Ophthalmology and Otology* a report detailing sixteen cases of the sort. Dr. H. L. Shaw has also given his experience of eighteen cases, in three of which the mischief was caused, not by the ordinary douche, but by the posterior nares syringe, and in one by the practice of snuffing salt-and-water from the hand through the nostrils. Dr. Bowen says there can be no doubt that in his own cases the disease was entirely due to the forcible entrance of fluid thrown by the douche to cleanse the nasal passages and pharynx. In five of the cases the pain and disturbance about the ear were observed immediately after the fluid was passed into the nostril, and in the remaining case the connexion was so close as to justify a positive opinion as to the cause of the serious suppurative inflammation that followed. The writer observes that the nasal douche is really a dangerous instrument, the use of which should be discarded, save in exceptional circumstances.

THERE is probably no anthelmintic so popular with general practitioners as *santonin*. It must, however, be within the cognisance of many that comparatively small doses have produced convulsions of a somewhat grave character. A German contemporary lately reported a case in which poisonous effects were produced in a child two years old by the ingestion of so small a dose as a grain and a half. Convulsions commenced in the face, and extended to the extremities, while the respiratory action was greatly impeded. Under warm baths, enemata, and artificial respiration, the patient recovered. The physician in charge of the case then instituted a series of experiments on the lower animals, and found that chloral and ether inhalations controlled the convulsions produced by *santonin*. He naturally argues that the same treatment should be pursued in the human subject when a poisonous dose is taken.

ERYSIPELAS AND PUERPERAL FEVER.—An American physician, with a large obstetric practice, lately reported several cases of puerperal fever. During a busy season he was called to see a case of facial erysipelas, and continued to attend his lying-in patients as usual. Immediately following the erysipelas case came eight cases of puerperal fever, six of which proved fatal. Another practitioner also relates that he had charge of a case of erysipelas of the great toe, going about his daily practice as usual. It so happened that he had a number of lying-in women at the time; three of them had puerperal fever, and died. The reporter states that he does not wish to discuss the identity of erysipelas and puerperal fever, but claims to assert that "facts are facts."

REMOVAL OF THE OS CALCIS.—Dr. Vincent, in his late thesis, states that the subperiosteal removal of this bone (as performed by Dr. Ollier, of Lyons) is generally followed by complete regeneration. Nineteen successful cases have hitherto been published, and refer principally to young people. Persons of mature age are less favorable subjects. In fact, Dr. Ollier says: "The extirpation of this bone is justified by chronic inflammation and the failure of all minor means of curing the disease."

## News Items, Medical Facts, &c.

RELATIVE VALUE OF CHINCHONIDIA AND QUINIA.—Some little time since the Medical Board of the Bellevue Hospital, New York, instituted experiments concerning the relative merits of the quinia and chinchonidia sulphates. The latter salt was used almost exclusively for over a month in the hospital. At the last meeting of the Board the members on duty related their experiences. The surgical members declared chinchonidia to be a valuable tonic and febrifuge, but found it to be quite inadmissible in severe surgical injuries, especially to the genito-urinary system, and in cases of shock, by reason of its tendency to induce emesis and congestive symptoms. In such cases chinchonidia had to be abandoned, and quinia substituted. In purely medical affections, however, such as fever, pneumonia, &c., its use was attended with good results. When the tonic effects of chinchona are desired, chinchonidia may safely be resorted to—a fact of considerable importance, bearing in mind the difference in price of the two salts. It is obvious that if the cheaper salt can be successfully administered in large institutions in cases usually treated with quinine, a great financial saving would annually be effected.

DETECTION OF LEAD AND IRON BULLETS IN GUNSHOT WOUNDS.—Dr. J. R. Uhler lately brought before the attention of the Maryland Academy of Sciences a method for the more certain detection of leaden and iron bullets when imbedded in the tissues, as in gunshot and shell injuries especially, where they have an obscure or curved course, and cannot be readily felt by the probe. The plan and its application are extremely simple. The wound is thoroughly cleansed with pure water by means of a syringe, after which a solution of nitric acid (5 to 15 drops to a drachm of distilled water) is injected into

PRINTED AND PUBLISHED BY

WM. C. HERALD, Nos. 58 & 54 JOHN ST., NEW YORK.









